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MODERN MANAGEMENT

MANAGEMENT OBSERVATIONS IN INDUSTRY

IN THIS ISSUE

- Management Control Through Cost Control in the USAF
- Procedures in Finance
- Well Organized Programs in Sight Conservation
- Profit and Loss
- Proper Inventory Control
- Poor Communications Waste Manpower

MAY 1952

Remington Rand Newsletter

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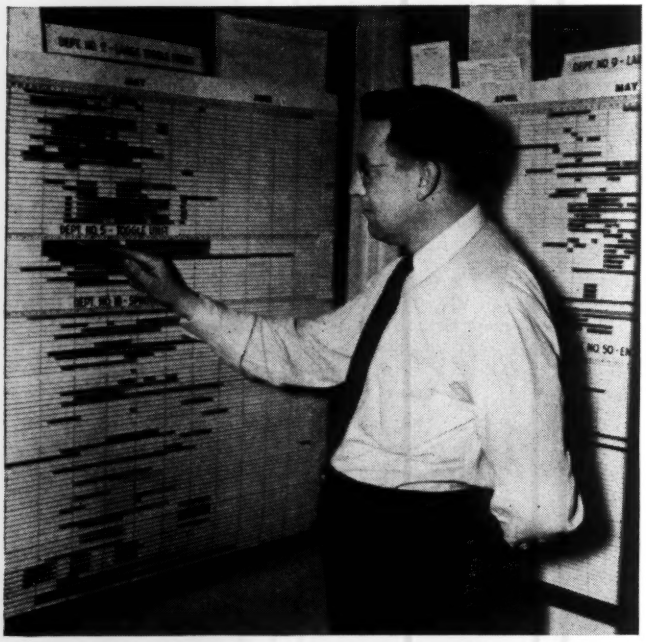

His foremen are better managers. "The entire psychology of our foremen has changed," says a plant superintendent, "since we took production scheduling out of office binders and put the machine-loading orders on Sched-U-Graph boards. Foremen now have the complete picture as they plan their work. They study the orders all at once to see which can be bunched for minimum setup time. They are better managers because they understand better what is to be done. We no longer use 'hot lists' to put pressure on them, yet we are getting better output per machine hour and better deliveries." For more facts on this simple method, see folders SN-629 and KD-320.

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For information, please request literature by number. Call our Business Equipment Center in your city, or write to our Management Controls Reference Library, Room 1079, 315 Fourth Avenue, New York 10, N. Y.

METHODS AND IDEAS FROM THE

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Management and Cost Control in the Air Force

By E. W. RAWLINGS

Lt. General, USAF
Commanding General, Air Material Command
Dayton, Ohio

E. W. Rawlings

The Air Force recognizing a need for better program planning and cost control, developed a successful business management program by adapting civilian management methods to the military organization.

THE UNITED STATES AIR FORCE has devoted more than four years to developing a business management program designed to increase economical operation of the Air Force by adapting civilian management methods to the operation of a military organization. Based on the USAF Cost Control System and Work Performance Program it is used successfully throughout the Air Force. Its effectiveness has been demonstrated not only in normal operating activities but in the costing of such important projects as the Berlin Airlift (Operation Vittles); the relief of distressed areas in the midwest during the winter of 1949-1950 (Operation Haylift); and the recent Atomic Energy tests in the Pacific (Operation Greenhouse) in which the total effort of a joint enterprise was measured in dollars for the first time.

FIRST COMES RECOGNITION

Faced with rising prices and increased operating and procurement costs after World War II the Air Force recognized the need for better program planning and cost control. New procedures in programming and cost management had to be developed and enforced if the greatest return for every dollar spent was to be achieved. The study of management procedures aimed at "management control through cost control" was started in 1946 by Mr. W. Stuart Symington, the Assistant Secretary of War for Air, and later Secretary of the Air Force. Emphasis was on a quantitative program to furnish data for economies without reducing quality. Service standards and efficiency of operations were to be maintained or improved. Savings could not be effected merely to achieve savings, but were acceptable only when they could be accomplished without sacrificing quality.

The cost reporting system was first installed in 1947 at several Air Force bases by requiring the reporting of gross costs of selected functions. These costs were to be analyzed, work units defined, and cost standards determined. Before this was completed, however, the system was revised in 1948, and the USAF Manual of Cost Reporting was issued and made directive upon all Air Force activities. Responsibility for the development and operation of the system was placed on the Deputy Chief of Staff, Comptroller, at the Pentagon.

Cost reports are now submitted monthly by every level within the Air Force (Headquarters USAF, Major commands, wings, bases, and depots) which show the cost of more than 185 functional activities. The system establishes management control designed to guard against unsound policies and permits immediate action on expenditures, and gives to commanders planning factors to allocate men and materials to certain tasks. These factors can also serve as a basis for building and monitoring programs and translating the programs into support of budget estimates.

WORLD-WIDE OPERATION

The Air Force is a vast and complex enterprise spending twenty billion dollars during the current fiscal period and employing more than a million people in its world-wide operations. No single standard can be used to measure results, but the dollar as a common denominator brings seemingly unrelated elements into focus.

In private industry, the balance sheet and profit and loss statements are ready measurements of efficiency, but these records have no exact counterparts in a military service. Cost is an essential element of profit, so it seemed desirable early in the cost control program to find a means of relating costs to successful operation in the Air Force.

Because of the various responsibilities of different units within the Air Force, it is necessary to break down these units into their component functions and then establish standards for each function to measure operational efficiency of the units. It is impossible to compare the passenger-miles and the cost-per-ton-mile

of the planes of the Military Air Transport Service with the training missions and bombing practice flights of multi-engine bomber or jet fighter squadrons. However, the majority of the functions in the various organizations — such as Finance, Adjutant, Civilian Personnel— are comparable.

MEASURING CRITERIA

The "Work Performance Rating" was the criterion selected to measure comparable costs of operation. Simply defined, it measures the relationship of cost of a given function to a standard previously established for the cost of that function. The Air Force borrowed a basic concept long established in industry which measures efficiency as follows:

$$\frac{\text{Output}}{\text{Input}} \times 100 = \text{Percent of efficiency}$$

This industrial concept was adapted to Air Force use by substituting this formula:

$$\frac{\text{Standard cost per work unit}}{\text{Actual cost per work unit}} \times 100 = \text{Work Performance Rating}$$

A work unit is a quantity used to measure the end product of a function. In heating a building, for example, the work unit is 1,000 cubic feet; for food service, it is $1 worth of food; for garbage collection, one cubic yard; for the base operations function, landing one airplane; for pumping water, 1,000 gallons.

STANDARDS

Determination of cost standards for measuring the relative performance for similar services at different bases was made initially by choosing 10 functions. Standards were obtained by taking a weighted average of cost where work performance studies had been conducted. These figures were used to establish average costs per work unit and were adopted as the tentative standards for the functions.

Work performance standards have since been completed for 25 groups of functions appearing on the cost control reports, including Adjutant Functions, Military Personnel, Maintenance and Supply, Motor Pool, Personnel Services, Supply Control, Commissary Sales Store, Dietetic Service, Food Service, Civilian Personnel, X-Ray Service, and Civilian Payroll.

The Work Performance Program embodies three principal functions: (1) to put into effect the policy of "management control through cost control" by providing methods for objective evaluation of operational costs by functions, facilitating comparison of a station's performance with the standards for similar stations in its class, and providing quantitative data for groups engaged in making qualitative evaluations; (2) to increase cost-consciousness by translating gross costs into more easily understood unit costs; and (3) to provide factors for use in preparation of the budget.

Every commander receives monthly reports showing how his base compares with others in its class thus providing him with an opportunity to detect activities where savings can be effected. Base commanders with high costs for certain functions are encouraged to visit bases where functions are performed more cheaply. Final action is never taken on the basis of the Work Performance Rating alone, but only after evaluation of the individual situation. So many factors are involved which might raise or lower costs for the same function at different stations that each case must be investigated on its merits before any change is made in existing procedure. The monthly analysis will indicate the administrative action taken, the contemplated action, and recommendations for such action when beyond the sphere of command.

ANALYSIS AND EDUCATION

The system is a program of analysis and education. It makes commanders and their staff officers cost-conscious by impressing upon them the size of the expenditures they control and by translating costs to units easily comprehended, such as $2 per airplane takeoff or $4 per hour of dental treatment. The commanding officer of a combat wing, (the wing-base was adopted as the basic Air Force unit in 1947. It is usually composed of a Headquarters and Combat group and 3 supporting groups — Maintenance and Supply, Air Base, and Medical) for example, has comparatively little cash under his direct control — often only $30,000 or $40,000 a year for local purchases. Yet he runs an organization which may spend a million dollars a month, most of it in indirect expenditures such as salaries, supplies, and maintenance, the cost for which is not handled directly by the commander.

Lieutenant General E. W. Rawlings

Lt. General Rawlings, a proved top-level management expert, has been in the managing end of the Air Force since 1945. A veteran of two previous tours of duty at Wright-Patterson Air Force Base, General Rawlings served as special assistant to the Commanding General of AMC in 1945-1946. He was called to Washington in 1946 and became the first comptroller of the United States Air Force. He was instrumental in the establishment of the comptrollership as a "key" management organization of USAF, — paralleling the "big business" approach of modern industry. General Rawlings served as USAF comptroller until he returned to Wright-Patterson in August, 1951, to become the Commanding General of AMC.

FLEXIBLE STANDARDS

The cost standards are flexible, subject to revision if indicated by additional facts or by reports from a larger number of bases. They include only operating expenses and not capital expenses. Different cost standards were established for different classes of bases, depending on size. In addition other factors besides population are considered which might affect the work unit cost, such as the mission performed, weather, or geographical location.

The basic objective of the cost program is the attainment of management control by analysis and evaluation of operations as reflected in cost and related reports, the measurement of operating results in terms of cost, and by assisting in the development and pricing of programs and in the preparation and support of the budget. The system provides management with information hitherto unavailable, and it is a powerful tool of management. The program is not complete but substantial progress has been made in introducing the types of dollar controls that are customary in business. Additional standards are being developed and existing standards revised. Integration of budget data with cost records is proceeding. The goal is a single reporting system to be used in support of budget requirements, particularly in maintenance and operations appropriations.

Although a sound and well defined system of control extending through all levels of the Air Force structure is a prime factor for producing efficient management, the human element in the management equation cannot be minimized. Dependence must be placed upon the skill and intelligence of the individuals who produce the end results.

OFFICER "KNOW-HOW"

Officers must be equipped with the fundamental training and "know-how" to operate the system and schooled in the latest developments and techniques in this field. Part of this specialized training is secured at the Air University, and in the field of management the University has implemented a program of graduate training involving courses at many of the country's leading colleges and universities. About 850 officers have received instruction in Business Administration subjects at 70 institutions. A special graduate course (10½ months) in business management is conducted under Air Force auspices at the University of Pittsburgh, known as the Air Force Advanced Management Course. This course supplements others participated in by the Air Force including the Advanced Management Course at Harvard, and graduate courses at Stanford, Northwestern, Columbia, Pennsylvania's Wharton School and other universities.

THE SIGNIFICANT PROBLEM

No problem confronting the Air Force probably is of greater significance than the establishment of improved management controls and the demonstration that the enterprise is operated in an efficient business-like manner. There has been a feeling that the emphasis given to management by the Air Force has been good publicity and window dressing to assist in getting peacetime appropriations and maintaining popular support. This is a false and dangerous misconception. The importance of good management is measured in terms of our public trust as the administrators of an expensive governmental activity. The importance of effective management of resources during a war would be measured by our ability to help defend the nation. The cost system is only one of several management tools within the Air Force and those who operate it to improve fiscal management are confident it will continue to result in more careful use of money, manpower and supplies that will effect savings by insuring more economical operation.

MANAGEMENT BOOKS *Recently Received*

Please order books directly from publishers.

Design and Control of Business Forms, by FRANK M. KNOX, published by McGraw-Hill Book Co., New York, N. Y., 219 pages, $6.50.

Lloyd's by C. E. GOLDING AND D. KING-PAGE, published by McGraw-Hill Book Co., New York, N. Y., 220 pages, $4.50.

The Cooperative Movement and Some of its Problems, by PAUL H. CASSELMAN, published by Philosophical Library, New York, N. Y., 178 pages, $3.00.

Compensation and Incentives for Industrial Executives, by ROBERT B. FELTER AND DONALD C. JOHNSON, published by Indiana University Press, Bloomington, Ind., 208 pages, $5.00.

Readings in Personnel Administration, by PAUL PIGORS AND CHARLES A. MYERS, published by McGraw-Hill Book Co., New York, N. Y., 483 pages, $4.50.

Business Forecasting, by FRANK D. NEWBURY, published by McGraw-Hill Book Co., New York, N. Y., 273 pages, $4.75.

Make Your Business Letters Make Friends, by JAMES F. BENDER, published by McGraw-Hill Book Co., New York, N. Y., 250 pages, $3.50.

Industrial Process Control by Statistical Methods, by JOHN D. HEIDE, published by McGraw-Hill Book Co., New York, N. Y., 297 pages, $6.00.

The Business Executive and His Financial "Peephole"

By JOHN E. KUSIK

Vice President, The Chesapeake and Ohio Railway Co., Cleveland, Ohio

Prompt accurate accounting procedures are not enough for aggressive management purposes. They can even be a handicap to the efforts of management in keeping abreast with current events.

TO DESIGN and operate for our companies effective financial instrument panels is an important part of our job. During recent years we have been literally flooded by books and articles telling us what management needs. Much less has been said about the ways of effecting the transition from what we now have. It is this problem of transition that has given us most difficulty on the C & O. Out of this experience there have developed some indications of how to proceed. I would like to pass these along to you.

1. First of all, we should recognize that: *for a financial instrument panel, financial data of past and current events and forecasts of the future, must be prompt and reliable.* How promptly are the financial indicators of your company available? How reliable are they? Are they based on habitual pessimism and efforts to play 100% safe?

Your response may be that excellent financial reports based on excellent accounting data tell you promptly and accurately how your business is doing. However, I would like to suggest very respectfully that, while, according to conventional standards, normal accounting procedures may be prompt and accurate, this is not enough for aggressive management purposes. Stated another way, a financial man's excessive reverence for normal accounting procedures may well be a major handicap to the efforts of management to keep abreast with current events.

MODIFICATION OF IDEAS

Let me hasten to say that I do not propose to do away with accounting or accountants. I am an accountant myself, accounting is among my chief responsibilities, and I recognize it as an indispensable management tool. I do offer, however, the following suggestions for modification of generally accepted ideas concerning financial reports:

A. Cast off the millstone of reliance on accounting closing dates for financial data. In collaboration with your accounting department, establish estimating systems which will produce all major financial reports well ahead of the regular closing dates. If an estimating system is used, there is no reason why an income statement should not be issued by the second working day after the close of each period.

These estimating systems would be concerned only with isolation of significant variations from the recurring revenues and expenses, or established standards. Recurring items would not require recalculation.

Reports produced through such estimating systems would serve most top management purposes. They would replace for current use all reports dependent on conventional closing dates. Data later developed by regular accounting procedures would be used as a check on these estimates, for auditing purposes and for periodic reports to stockholders and government agencies — none of which carries as urgent a deadline as management control data. Let us remember that even the so-called "actual figures" are at best only approximations of realities!

My second suggestion is:

B. *Insist on greater reliability of financial data!* How is this possible with an estimating system?

As you know, the answer is that precision down to the last cent is of importance only with respect to individual transactions and for auditing purposes. Such precision is not needed for management decisions.

The important thing, especially at business turning points, is to have available reliable financial facts—reliable only in the sense of rounded off approximations, sometimes in thousands of dollars or even millions. These are much more useful than conventional statements which appear to be precise because they are expressed in dollars and cents. Precision of this sort is an illusion when such statements contain severe distortions produced by accounting adjustments or arbitrary prorations.

The specific prorations or allocations I am talking about are those which have to do, for the most part, with so-called regulated costs. They are not directly related to business volume. They are incurred by managerial decisions. In the railroad industry, such costs are a large proportion of total operating costs. This is likewise the case in most other types of business. Design engineering, space advertising and maintenance expenses, usually determined at the beginning of the year or some longer cycle, fall into this category. In making cash forecasts, it

is, of course, important to know the period in which the actual disbursement will be made. However, in reporting earnings for a period, some other basis of recording these expenses might be more useful.

I recall a solemn meeting of distinguished financial men debating at some length the question of when to charge such expenses. The final decision was to record advertising expense, which fluctuated widely, in the periods in which actual payments were made. This was done in the name of so-called "integrity" of accounting, overlooking the fact that from a managerial standpoint, the income account could become seriously distorted.

C. Use the breakeven chart technique to test the reliability of your accounting data. Breakeven charting calls for careful review of classifications for revenues and costs; segregation of costs between variable, regulated and fixed. Experience shows it is useful in spotlighting unusual occurrences and enforcing more careful planning of prorations.

A financial control panel, to be of value, must reflect significant events promptly. It must not let them be buried under slow-moving or old-fashioned accounting procedures nor must it allow them to be buried under meaningless adjustments, practices which alert accountants everywhere are themselves anxious to avoid or change.

D. Do not be a chronic pessimist. Let's say that a chronic pessimist is a fellow who, on a picnic day, squints at the cloudless sky and proclaims that it is going to rain!

It is a normal function of a financial man to serve as a balance wheel for other functions of the business, in making financial appraisals of current events and future probabilities. However, it is dangerous to assume the attitude of playing 100% safe. In the first place, it will lead to a timid withdrawal from the realities of life. It will lead to an insecure hideout behind the walls of paper documents which inevitably surround unwary financial men. Moreover, the results of such a withdrawal are usually disastrous, even though disguised for a time, because 100% safety is unattainable. Anyone can lose—by playing 100% safe! While viewing realistically the unpleasant facts and possibilities, the financial man with vision will not overlook the favorable facts.

So much for promptness and reliability in financial reporting.

2. I now turn to the second requirement: *for a financial instrument panel you need an unobstructed view of all phases of operations.* Are you restricted to a "peephole" view?

If you are, you may as well give up the idea of streamlining your financial reporting system until you have enlarged your participation in the stream of management effort.

YOU NEED CONTACTS

The detailed construction of a financial instrument panel for any company is determined by its own characteristics and problems in the fields of marketing, manufacturing and capital requirements. And it is also determined by the source of money used in the business. These characteristics cannot be discovered through arm chair studies. As a financial man of your company, you should spend a large proportion of your time eating and sleeping, so to speak, with the men in the other fields of management, learning what they are trying to accomplish. You should have more than only a general familiarity with your marketing outlets and manufacturing plants.

In order to be able to design and maintain a good instrument panel for his company, the financial man must maintain his feel of operations through close personal contacts with the level at which the work is being done. This means not only financial areas but all areas. Intimate, frequent immersions into the environment of the other functions are especially important to financial men. We are prone to become separated from the realities of life by our wall of paper documents and by overcaution—both of which can block from view the very realities which we are trying to evaluate. A first-hand view of these realities will readjust the distortions which develop when our view is confined to a mere peephole in a wall of paper.

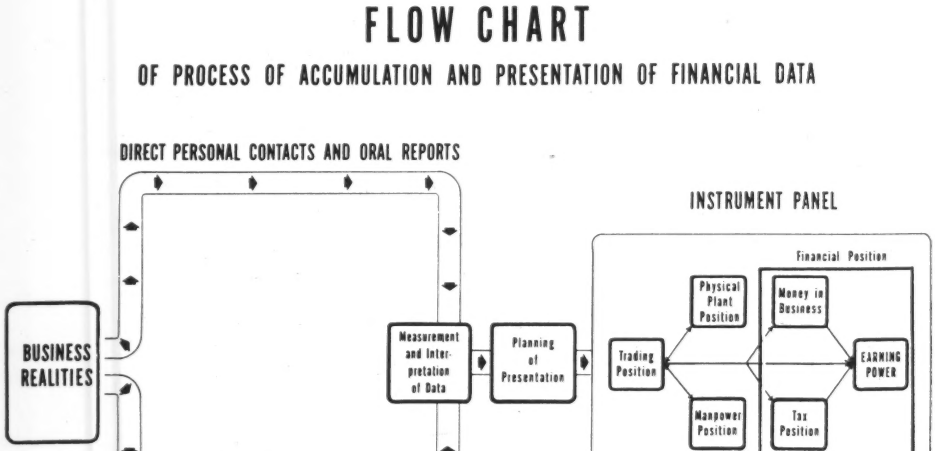
If you are the top financial man of your company, you should spend as much as half of your time associating with the other functions. Raise your relations above the paper level!

3. The next requirement for an instrument panel is a flow chart, which, like a wiring diagram, would assure an orderly flow of facts and impressions. Here is C&O's flow chart! How does it work?

THE CHESAPEAKE & OHIO RAILWAY COMPANY

FLOW CHART

OF PROCESS OF ACCUMULATION AND PRESENTATION OF FINANCIAL DATA



(1) The block on the extreme left symbolizes what is going on —that is, business realities. Facts and impressions flow from these realities toward the instrument panel on the extreme right.

(2) The upper channel represents personal contacts and oral reports. It emphasizes the necessity of close personal contacts of financial men with all phases of operations.

(3) The lower channel starts out with the traditional reporting system—the first three blocks: Basic Business Documents, Standard Accounting Records, and Basic Financial Reports. However, instead of relying solely upon this old part of the channel, quick, short-cut - statistical methods are used to speed up the transmission of data by by-passing standard accounting records and financial reports. Such short-cut data may be in dollars or they may take the form of unit measurements such as tons of material or manhours of labor.

(4) Provision is also made in this lower channel for "work charts of indicators of business position."

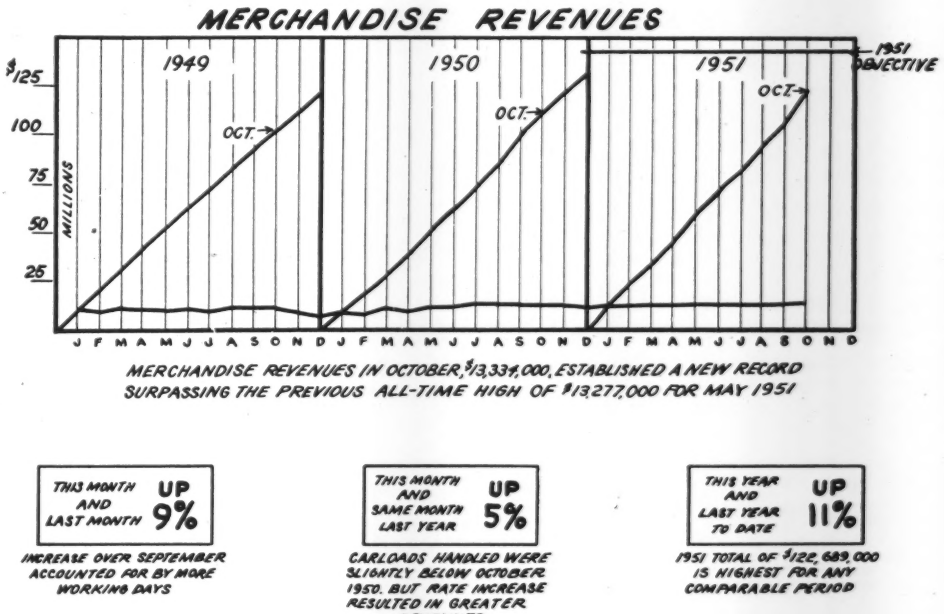
On the C&O we keep over 100 different work charts for various phases of our business. Their purpose is to discover and spotlight promptly for further investigation any apparent significant turn of events.

(5) Data obtained from these various sources is carefully analyzed and measured. Whenever necessary, discussions are held with other department heads or men on the ground to make certain that data are properly interpreted.

(6) After all of these facts have been measured and interpreted, the planning of presentations is the next important step. Presentations must be free of confusing financial and accounting terminology because most management men do not understand it. The objective is to present the facts concisely and simply.

Such of our major recurring presentations as the monthly report to Directors are redesigned about once a year. Ideas for improvement are accumulated for use at one time. We solicit suggestions as to improvement from other departments. Frequently, we ask the advertising and public relations departments to check over our presentations.

For a quick example of a technique of presentation, you may be interested in this chart. It shows a suggested innovation for presentation to management of C&O's merchandise revenues — "Net sales billed to you!"


MERCHANDISE REVENUES
1949
1950
1951
1951 OBJECTIVE
OCT.
$125
100
75
50
25
MILLIONS
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
MERCHANDISE REVENUES IN OCTOBER, $13,334,000, ESTABLISHED A NEW RECORD SURPASSING THE PREVIOUS ALL-TIME HIGH OF $13,277,000 FOR MAY 1951
THIS MONTH AND LAST MONTH UP 9%
INCREASE OVER SEPTEMBER ACCOUNTED FOR BY MORE WORKING DAYS
THIS MONTH AND SAME MONTH LAST YEAR UP 5%
CARLOADS HANDLED WERE SLIGHTLY BELOW OCTOBER 1950. BUT RATE INCREASE RESULTED IN GREATER REVENUES
THIS YEAR AND LAST YEAR TO DATE UP 11%
1951 TOTAL OF $122,689,000 IS HIGHEST FOR ANY COMPARABLE PERIOD

This chart is designed to show at a glance how we stand in relation to our objective as well as in comparison with past periods. For example, "This month UP 9%." Short comments are added to point up the significant trends, "Merchandise revenues in October, $13,334,000, established a new record surpassing the previous all-time high of $13,277,000 for May 1951."

We have covered in our discussion, thus far, several major elements of a successful financial instrument panel—the importance of promptness and reliability, the importance of an unobstructed view, and the flow chart.

4. *We have now reached the Financial Instrument Panel itself.*

This instrument panel consists of six major subdivisions of the reporting system, grouped into two parts—"Trading Position" and "Financial Position." The goal of all operations is presented by objectives of "financial position," into which all current planning and performance measurements are geared. These objectives are reached through skillful interplay of financial and trading factors, directed by management.

TRADING POSITION

The *trading position* of a business consists of such factors as the product being marketed, its markets, channels of marketing, prices, volume and costs, all combined with availability of skilled manpower and management personnel. These factors produce a desired trading profit and industry position. Obviously, leadership in planning the objectives of trading position, as well as for performance, belongs with marketing men, designers of products and manufacturing men, all fitting their planning and operations into the trading objectives. The function of the financial men is to serve

all these groups by representing financial objectives, and by participating in constructive critical exchanges of views.

For the purpose of the instrument panel, the financial man maintains only a few basic indicators of the trading position. These include data regarding profit margins, volume, prices and costs, as well as industry standing.

INDUSTRY STANDING

On the C&O we maintain a close scrutiny of our industry standing. For example, for merchandise traffic we follow the trend of new industries brought to our lines and the proportion of available traffic secured by us. For coal traffic, we watch the percentage of total bituminous coal mined in this country, handled by C&O. Effective management usage of any instrument panel, such as we have been discussing, would project into the future the trend of the company's industry standing. It was by this process, centering around anticipated increases in coal shipments, that management decisions were made on C&O which led to increased marketing effort and acquisition of additional facilities. As a result, we found ourselves ready in 1951 to handle 13.3% of national production of bituminous coal as compared with 11.7% in 1946. C&O has increased its share of available traffic but we now ask ourselves, what should C&O's objectives be during the *next* 5 years?

In our planning of financial indicators for the trading position, we have created a separate grouping of indicators for physical plant. This was necessary because of the financial magnitude, in railway operations, of even routine additions and replacements. Moreover, our total investment in physical plant is, relatively speaking, much greater than in the case of most industrial companies.

The problem of facilities is, of course, the province of engineers and manufacturing men. However, there are some areas in which the financial man should seek proper indicators of current position and trends. For example:

A. Extent of modernization of facilities. The cost reduction effect of up-to-date facilities and the extra costs of obsolete facilities both have an important bearing upon the earning power of the company. On the other hand, improper deferment of improvements and maintenance can destroy its earning power and financial position.
B. Effectiveness of utilization of existing facilities may likewise exercise a major effect upon the earning power of the company. Hence, it is the duty of a financial man to satisfy himself that proper controls are in existence. He should determine what effect utilization of facilities has on current earnings and future trends.

On the C&O it takes, on the average, about two weeks for one of our 60,000 coal cars to get loaded, hauled to destination and returned to the mines. We call this turnaround—the same concept as turnover. We find that improvement of as little as one day in this turnaround will enable us to reduce our coal car fleet by 4,000 cars. This would reduce our investment by over $20 million; our fixed charges and operating expenses would be reduced by about $2 million a year.

C&O has done well with its physical plant position but, management asks, what should its objectives be during the *next* 5 years?

MANPOWER POSITION

Another subdivision of the trading position for which we provided a separate grouping is the *manpower position*. This was again done because of its special financial importance to C&O. More than 40% of every C&O revenue dollar is paid out in salaries and wages.

It is primarily the function of operating and personnel departments to be concerned with the many complex problems of manpower position. However, the financial man, in constructing the instrument panel, should include some indicators of labor costs, productivity and trends. A current acceptable earning power position may be quickly changed by loss of labor productivity or wage increases.

Similarly, the financial man must know and reflect in the instrument panel, the status of pending salary and wage increases.

C&O has made good progress in improving its manpower position. However, management wants to know, what should the objectives be during the *next* 5 years?

FINANCIAL POSITION

We now move over to the *Financial Position*.

In setting up controls for "financial position," you need to know the financial objectives of your company. Do you know what they are? Does anyone know? Or is your company just drifting along without any clear objectives?

On the C&O the measurements of progress in the company's "financial position" include:

A. Taxes—in terms of:
   (1) Excess profits exemption.
   (2) Effect of 5-year amortization program.
   (3) Other objectives for increasing allowable tax deductions.
B. Money in Business—is measured in terms of objectives for:
   (1) Working capital.
   (2) Equipment obligations.
   (3) Long-term capital, represented by bonds and stockholders' equity.
   (4) Interest charges on borrowed capital.
   (5) Dividends.
C. Lastly, Earning Power—is measured in terms of objectives for:
   (1) Breakeven point.
   (2) Earnings per share of common stock.
   (3) Return on investment.

As financial men, it is our job to find out the proper level and balance for these sometimes conflicting objectives. The financial position of the company cannot be left to chance. Without them, our business would lack a substantial part of the impelling urge to do better. Without clearly understood financial objectives, the budgetary control systems and other management control devices would lack a real sense of direction or meaning. This emphasis of the need of having long-range financial goals, is the main point of this phase of my discussion. It is of special importance to the companies which obtain their capital requirements from earnings. They lack such severe automatic tests of financial market places as the level of maturities, coverage of interest charges and interest rates obtained on new borrowing.

Now, a few more specific comments about some of the important items of "financial position" which are of common interest to all types of business.

We must recognize that all financial objectives are governed by the insatiable demands of a loud partner in the division of profits—the tax collector. This factor has made taxes a top management problem.

Federal and local taxes are handled in some companies by financial men, but often by others. With the ever-growing share of profits taken by taxes, the financial man must have a thorough understanding of the tax position of his company. No matter by whom taxes are handled, the financial man and other executives should have available to them periodic restatements, in laymen's language, of the tax position of the company. This will maintain the general awareness of the need of considering the tax effect wherever alternative courses of action may be available. No financial instrument panel would be complete without careful planning of indicators of tax position and its objectives.

"STORM RESERVES"

Aside from normal day-to-day requirements for working capital, all business concerns should carry some "storm" reserves for such contingencies as sudden drops in business volume and shutdowns because of strikes. Unless some predetermined standard is used for its accumulation, there is a danger that the "storm" reserve will not be there when it is needed.

Of course, the standard for working capital is not something that can be computed on the basis of ratios. It must be determined by a study of the characteristics of the business. In our own case, we feel that net working capital should be sufficient to:

A. Hold the existing dividend rate in the face of a severe, relatively short-term drop in earnings.
B. Provide a reserve for continuation during such period of necessary capital improvements normally financed from earnings.
C. Provide some additional safety margin for unforeseen contingencies and the normal impossibility of cutting controllable expense in too close a parallel to fluctuations in operating revenues.

Again the important thing to note is that management has to set a predetermined objective for working capital. On one hand it should be adequate for all reasonable needs. On the other, it should not be set on the basis of over-conservatism. Idle cash does not bring any return. It may lead to lax capital administration and endanger the safety of the working capital or the business itself.

The consequences will generally show up in weakened collection effort, excess inventories or unproductive capital additions resulting from poor screening of proposals.

EARNING POWER OBJECTIVE

Next, let us consider *Earning Power Objective*—the final area of "financial position."

The maintenance of the earning power of a business concern is like the ability of an individual to lay aside, over his lifetime, a portion of his income as savings. It is the amount of money which is left over after operations. However, how much is left over is determined to a large extent—in the case of the individual, by his savings objective, and in the case of a company, by its earning power objective. It calls for determined effort on the part of management to maintain a definite goal for the company's earning power—not for a year or two, but over the long range. It calls for maximum effort of keeping income up and costs down.

The pressure to reach or maintain earning power objectives, in the face of rising costs, generates a continuous vigorous drive toward opportunities for new business, for cost reductions through increased mechanization and work simplification, for selective price increases and for elimination of unprofitable products and services. Very important, however, is one other function of the earning power objective—it gives an important indication of when to say "no" to proposals which may lead to greater sales volume but cause disproportionate increases in costs.

Much has been said about the rising *breakeven point* during recent years and its effect on earning power objectives. The higher the breakeven point, the larger must be the volume of sales needed to produce a profit.

In these days of inflationary cost increases, many segments of industry have been prevented from seeking larger volume of sales because of government restrictions or other limitations. More and more have they sought price increases to offset rising breakeven points, thus being forced to play the game of a dog chasing its tail. As a consequence, it has become more important to measure the safety margin represented by the excess of current volume over the breakeven point, than the upward movements of the breakeven point itself.

Our safety margin, i.e., the current excess of gross revenues above the breakeven point is close to 60%. The fact that the ratio of excess has remained approximately the same for the last several years, despite drastic cost increases, indicates a substantial degree of success of efforts to preserve the company's earning power.

RETURN ON INVESTMENT

It has been said that *return on investment* for the railroad industry should average over good and bad years 6% per annum. What it should be for C&O is, of course, a matter of considered judgment, but we do have an objective in mind. C&O's performance has been consistently better than the industry even in 1949—the year of the disastrous coal strike. The point is that management should not merely accept a projected rate of return simply as it happens to come out as a result of non-financial, so to speak, planning. It is its responsibility to establish a carefully considered long-range objective for a rate of return to which budgeting and planning will conform.

As you know, an established dividend rate which is liberal in relation to earnings tends to back up or stiffen other earning power objectives. Another very important function of a difficult dividend objective is that of safeguarding proper compensation of equity capital used in the business.

It has become a tradition to expect from C&O a liberal dividend. The last quarterly dividend was increased to 75 cents. This new rate, if continued, would return C&O's dividend payments to the level which has been in effect for a long time.

In any event, aside from having to give serious weight to a long-established tradition, it is incumbent upon management to do better, if possible. This attitude will, in turn, stiffen management's backbone in efforts to maintain or increase the company's earning power.

What a Well Organized Visual Program Means

By LOWELL F. JOHNSON
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Lowell F. Johnson

Although it has not received as much publicity as the more dramatic phases of health and safety, sight conservation is nevertheless of paramount importance in day to day labor relations.

THIS IS A SUBJECT in which I have had a profound interest for many years. My interest is deep seated and was developed intimately and early. During my formative years my Father lost the sight of one eye in an industrial accident. Later, while an attache in the New Jersey Legislature I was associated with a prominent New Jersey statesman who lost the sight of both eyes because of faulty lighting in the newspaper office where he was an editor. The tragedy in both of these cases is that with proper planning and application these terrible losses could have been averted.

A recent study on "Why Are They Blind?" was made by the Maryland Society for the Prevention of Blindness. The study ran for a period of six months and included the examination of 104 blind persons by Ophthalmologists and Eye Clinics in the Baltimore area. Researchers listed four major causes for this needless loss of sight, (1) lack of sufficient health education in the care of eyes; (2) the failure of the general practitioner who first handled the case to administer proper treatment; (3) the patients' poor response to treatment, and (4) preventable accidents. These are areas in which we all have a concern. Colonial Airlines expresses it succinctly in their slogan "Safety is No Accident".

Although the matter of sight conservation has not received as much publicity as some other of the perhaps more dramatic phases of health and safety, it is nevertheless of paramount importance in day to day labor relations. The relation of vision to safety is better recognized than its relation to production and efficiency. There must be new emphasis at this point because the results are measurable and are of economic significance.

I certainly don't have to tell you what has become readily apparent to me; that there is a substantial difference of opinion as to what is embodied in a well organized visual program. Fortunately, I do not have to address myself to that question and shall leave it to the experts. My investigation, however, does indicate that the differences here are relative since many companies are obtaining significant results while using very different approaches to the problem.

USE IN SOME COMPANIES

Some of the best work and a very high portion of the writing and investigation in this field seems to have been done by the several companies who have equipment and services to sell to implement the establishment of well organized visual programs. I am grateful for the material they have made available to me although I have felt obligated to refrain from using much of it because of possible commercial implications involved.

It seems to me that what is of importance to industry and of real concern to labor is the placement of emphasis on the matter of eye conservation to a marked degree primarily in industries where known and obvious eye hazards exist. This emphasis on protection must change to correction and protection. This is an approach which has characterized a great deal of what industry has done in the field of employee relations. It's the process of putting out fires when in fact the conflagration might have been prevented. The old preacher put it compellingly when he said "I'se always makes it a policy to cooperate with the inevitable". This is a philosophy which has characterized too much of what goes on around us and in its place should be substituted a policy of helping to shape the inevitable.

Labor relations problems have their genesis at many points on the industrial scene. They may turn up as grievances, personality problems, scrap losses, quality and quantity problems, accidents, absences and a host of others familiar to most of you. Professional studies of these problems have traced the sources of many of them to problems of vision. This is no welfare approach but rather a practical dollars and cents proposition with humanitarian as well as economic by-products. This is the avoidance of the creation of human scrap and all that it means to the family, society in general, and being brutally practical, to manufacturing and insurance costs.

There seems general agreement among researchers in the field that at least half of the employees in a typical industrial operation have visual inefficiencies of some type that do not permit optimum job performance. As the average age of the working population increases there is statistical evidence that visual problems increase at a corresponding rate. As a matter of good labor relations it is of further interest to note that probably better than 90% of all visual handicaps will yield to the tested principles of a well organized visual program. This is something from which both management and the worker profit. During the last war the War Production Board made studies of reasons for spoiled work and found that visual problems accounted for over one third of the scrap. There was further evidence that employees with good or corrected vision give a greater return on management's investment in the capital equipment which the worker uses. In accident compensation alone eye injuries are said to cost industry upwards of $20,000,000 annually. That cost would pay for a major portion of the preventive work which is needed, and just think of the possibilities in collateral savings. Safety experts estimate that ninety-eight percent of the thousand or more eye injuries suffered by the American working populace each day could be avoided. These are negative statistics but serve to point up the possibilities in an affirmative approach to the problem.

SELECTION PROCESS

We become wedded to most of our labor relations problems at the point of employee selection. In many contractual situations there is no easy turning back from this point. Many of the largest corporations in America spend vast sums of money annually in the selection process on everything from credit reports to personality test batteries. There is evidence that only ten to fifteen percent, however, are doing an adequate job on a careful visual examination at the point of selection. The dictionary of occupation titles lists some 25,000 operations from the classic crane operator with his need for superior distance skills to the hosiery looper who does extremely close work. In between, there are many degrees of jobs with their own special visual demands.

The Purdue University Industrial Vision Institute made a study of several thousand employees in fifty industrial plants over a five year period. They found that the visual skills necessary for safety, high production, and good quality of work are lacking in from ten to fifty percent of industrial employees. For the good of both the employees and the management these visual problems must be picked up at the time of selection and corrective measures as well as careful placement take place to implement the program. There is evidence on all sides that the average employee wants to know more about himself—even his shortcomings! Helping him to round out this information and to take corrective measures can only result in improved labor relations.

JOB SATISFACTION

If we are going to have good labor relations, we still need to give more attention to this nebulous thing we call job satisfaction. As jobs have been simplified in recent years more of the sense of accomplishment has been taken away. Certainly another source of dissatisfaction is developed when employees are not matched to the job for which they are visually capable. This means that modern job analysis should include determination, among other things, of the visual capacity an employee should possess to perform the job to his and the management's satisfaction. Just the fact that an employee is already wearing glasses in no way indicates visual preparation for all jobs. As a matter of fact it is probably the antithesis and reason for further examination. The type of test or examination given must be carefully matched with the demands of the job. It seems to me incumbent on those professional personnel, who have responsibility for any phase of the physical examination, to be thoroughly familiar with these job requirements. This is just as true of the visual demands as it is of those of strength or finger dexterity.

If vision at all is required on a job it is safe to assume that a man cannot work any better than he can see. A recent study in a large Eastern plant revealed that thirty-seven percent of all spoiled work was due to inefficient vision. One medical director estimated that inefficient vision runs perhaps as high as seventy-five percent in old employees and at least twenty-five percent in the younger group. In addition to this, many believe that much of the average individual's emotional stability is controlled or at least strongly influenced by his ability to see. This, of course, brings up the old question as to how far a well organized program should go in order to contribute to good labor relations. Is correcting vision for the job enough to produce general eye comfort for everyday living?

TOTAL HEALTH

If industry is going to be interested in the total health of the individual, however, the answer to the question seems obvious. Although, in recent years, we have come a long way since the use alone of the Snellen wall chart there is apparently still some distance to travel before we reach the optimum in a well organized visual program. In one hosiery mill it was found that girls who rated low on the Snellen letter chart test were the best producers on the looping operation which required good near point vision. They, of course, needed correction for distance vision, but if that Company had used the Snellen test alone in its selection procedure it might have eliminated many of its best employees. I have indicated that management can avoid many of its labor relations mistakes at the time of selection. After selection the mistakes have to be absorbed into the work place. However, the impression should never be left that the vision program is a scheme to screen out otherwise undesirable employees. Labor leaders are frequently suspicious of new things. Both union officials and supervisors should be informed so that they can answer questions and help enlist the support of employees. Often these men can assist the professional group in establishing visual requirements for various jobs. One steel plant in the Pittsburgh area had a good experience with this procedure.

The medical director of a large Mid-Western industry said recently, "The best visual program for industry is not dependent on the physician alone or on the personnel or employment manager. It must be based on a fraternity of effort; there must be team work between the medical department, personnel officer, safety director, training, and above all the foreman or supervisor, the latter particularly because he has to live with these individuals at least eight hours a day." As a practical matter the good doctor

might have added the union officer to this group.

He said further, "It is important to keep this in mind that progressive management does not have visual problems; it is the people who apply for work or those already gainfully employed who have visual problems. If we are to 'humanize' industry through a visual program, it cannot be looked upon as a charity or a philanthropy. It is just good business."

AFFECT UPON LIFE

Dr. M. H. Kronenberg of the Caterpillar Tractor Company told me this Summer that of their applicant group for one year covering 10,800 people they found 1,620 or fifteen percent who required prescription safety glasses as a necessary part of the job assignment. He further pointed out that 540 or five percent of these applicants had an eye defect which was non-correctable and they required specialized and specific job placement. As a matter of good labor and public relations the doctor indicated that it is their thinking that the visual program where properly and ethically organized reflects itself not only in the working hours of the day for such individuals, but affects the whole life of the individual. It not only affects his attitude on the job but in turn is reflected in his home life and community relationships. Good vision means not only good sight for a specific job, but eye comfort for on and off-the-job sight needs and requirements.

This is certainly a fine philosophy on which to rest any well organized visual program and is probably reasonably representative of that which motivates such programs in large industries. I couldn't help thinking, however, as I wrote the foregoing as to what is being done for the vision conservation of the worker in small industry. After all; American industry is small industry with something in the neighborhood of ninety-seven percent representing plants or organizations with less than 100 employees. Such organizations can afford relatively little professional staff assistance and should represent a challenge to this group to furnish professional services on a pooled basis before some bureaucrat gets the idea that the federal government should get into the act.

A heavy industry in the Midwest reports that there was a degree of apprehension among their employees concerning their visual program. Most of this apprehension was due to a concern for job security and a fear of not meeting minimum visual standards. Security is always a prime concern to labor and the very reason for the labor contract with its seniority and related clauses. Since the start of the safety goggle program in this Company there have been no lost time or disabling eye injuries, according to their latest report. The program has proved its worth in terms of protection to employees and equipment, improved job efficiency and affords a personal safety contact with every man on the job.

It is frequently a revelation as to what can be developed from personal contacts where the employee is discussing himself. Many companies have found that during the eye examination, with proper questioning, much information can be developed painlessly concerning health and safety conditions in the department where each employee works. Information which can be developed in no other way and of the type which intimately affects each employee. A textile mill found that its program also prods supervision into improving its knowledge of job requirements and personnel procedures in addition to stimulating an appreciation of the employee's point of view and increasing employee efficiency. This is another part of the personnel program where the cost of the program is only a fraction of the savings it effects.

In three years of experience with a modest visual examination and correction program an Oil Company reduced its cost of eye care by 81.7 percent. This was in addition to the personal and personnel saving which is something that doesn't readily lend itself to measurement.

MERIT RATING

Merit rating is a frequently used tool in the industrial relations program. A Southern manufacturer had some interesting findings in this connection. In a bag factory, of the workers rated as good by their foreman eighty-three percent had good vision, seventeen percent had poor vision. Of workers rated as poor performers one hundred percent had sub-standard vision. Of cotton mill workers rated as good by over-seers one hundred percent had above-standard vision. Of workers rated as poor eighty-two percent had poor vision, eighteen percent had good vision. Bleachery workers were also merit-rated by their supervisors. Of workers rated as good, eighty percent had adequate vision, twenty percent had inadequate vision. Of workers rated as poor, one hundred percent had inadequate vision. This Company's experience is further proof of the relationship between performance and visual adequacy and I might add supervisory judgment.

A Chicago electronics manufacturer had a similar experience. One hundred employees were tested in the Outgoing Inspection Department. The results disclosed that thirty percent of the employees failed to meet the standard of visual skill necessary to their respective jobs, and of these sixty-three percent had been termed below average workers by their supervisors. Within two months after the program started rejects had been reduced by seventy-five percent. In order to avoid the usual feeling of insecurity and to help bridge the correction period the Company appropriated $5,000 toward the correction of individual employees' visual difficulties. Since this was done two years ago the Company feels that it has been repaid many times in good will alone with a salutary effect on labor relations. Other benefits were reflected in reduced turnover, reduced absenteeism, higher production, fewer rejected units passing into the field and a thirty-three and one-third percent reduction in machine accidents.

Another Chicago Firm and one of the country's largest printing companies has reached some compelling findings on the degree of importance that vision has to performance on the job. It has found that proofreaders who meet the minimum visual requirements are thirty-seven percent more accurate than those who fail to meet the minimum standards. They have seven and nine-tenths points higher efficiency and produce a net productive value of twelve cents per man hour more than those who fail to meet the minimum requirements. Monotype keyboard operators who meet the minimum visual requirements have nineteen and one-tenth points higher efficiency and produce a net value of seventy-one cents per man per hour more than those who fail to meet the minimum requirements. While monotype runners who

meet the minimum requirements have nine and eight-tenths higher efficiency and produce a net value of eight cents per man per hour more than those who fail to meet the minimum visual requirements. This Company's experience can undoubtedly be duplicated by other firms in the printing industry.

I have reported to you in the foregoing a number of experiences with visual programs where the main emphasis has been on the correction of individual visual deficiencies, because my subject had to do with people. Time doesn't permit investigating the possibilities inherent in the area of illumination. Suffice it to say that the work place must have the optimum in lighting, color conditions, and reflection factors if the corrections made on the individual are going to be brought to their logical fruition. Only then can the employer and the employee receive the full fruits of a well organized program and its contribution toward good labor relations.

Dr. Kronenberg sent me a list of the benefits which they have gained from long experience with a well organized visual program. These might well serve as a conclusion for this article, and indicate the broad advantages which are possible under a well organized program.

BENEFITS TO THE EMPLOYER

- Assures healthy and safe personnel
- Avoids entrance of potential human liability
- Improves efficiency of work
- Assures satisfactory products
- Reduces labor turnover
- Promotes safety
- Improves employee relations
- Guards against fraudulent claims
- Reduces the cost ratio of insurance
- Protects against public criticism
- Provides necessary decision as to employee physical fitness
- Affords proper job placement
- Furnishes necessary data for legal claim department
- Promotes commercial relations
- Improves your own trade position

BENEFITS TO THE EMPLOYEES

- Reduces possibility of accidents due to physical impairments or defects
- Affords proper job placement
- Increases period of gainful productive employment
- Prevents development of disabling disease
- Insures family and dependents a more stable economic security
- Assists in obtaining benefits due
- Aids in reducing medical cost
- Protects fellow employees
- Assists in upgrading employee safety
- Aids in adjustment of his work
- Provides him with definite information concerning his own physical condition
- Reduces lost time and lost wages
- Learns the importance of prompt and expert medical care
- Learns to use the doctor and nurse as a confidante and counsellor
- Acts as an incentive to protect his own health

Many of these things do not lend themselves to dollars and cents measurement with exactitude any more than does preventive medicine. We do, however, want to gain their advantages in the traditional American way of doing the job ourselves. That's good for labor and good for management!

During the past ten years we've heard a great deal about methods improvement, work simplification, plant layout, process flow and other elements of industrial engineering and what they mean in terms of increased output and worker satisfaction. In fact some of the findings have been something short of startling. It seems to me that the potential in a well organized visual program offers similar almost limitless possibilities. Possibilities, not only in terms of increased output and its economic consequences, but also an opportunity for the worker to make the optimum use of his visual potential and all that that means in terms of a well rounded life and improved labor relations. This might well be the key to that little extra effort which we so badly need in these times and which has always characterized American ingenuity.

Someone has said, quite correctly, that if you want your father to take care of you — that's Paternalism; if you want your mother to take care of you—that's Maternalism; if you want Uncle Sam to take care of you — that's Socialism; if you want Uncle Joe to take care of you—that's Communism;—but if you can take care of yourself — that's good Americanism.

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Profit and Loss Sharing

By F. W. WILLEY
President, Willey-Wray Electric Co.
Cincinnati, Ohio

Profit sharing science deals with many individuals of all levels of management—therefore making it definitely in the field of human relations in industry.

MORE THAN A quarter century of observation, application, reading, writing, speaking and listening to others speaking in any particular area of thought should result in interesting conclusions in any mind of philosophical tendencies. Ripening age adds the opportunity of contemplating the forest first. Then the individual trees may be placed in their proper perspectives.

NOTHING NEW

Profit sharing in industry is not new but the very rapid expansion in recent years has attracted widespread attention. Many enterprises are seeking plans or patterns of plans that will fit their needs. The Council of Profit Sharing Industries has assembled a record of many successful plans and sorted them into various categories. This provides certain generalizations to aid newcomers in procedures.

Most of the speeches and articles on the subject are by individuals who have intimate experience with one particular successful plan. The author is one such. The wide variation in objectives and applications of profit sharing has produced hundreds of plans. This leads to certain confusion in the minds of those just entering the field.

This has led to the author's desire to put in writing certain observations on the underlying or basic principles which might provide background, pattern or foundation for consideration at the inspection of any type of profit sharing plan. Every science is founded upon basic laws or principles. The profit sharing science deals with many individuals of all levels of understanding. The foundation must be sound and deep. The problem is definitely in the field of human relations in industry.

The most important principle in human relations is expressed in the Golden Rule. It is as old as mankind. It is a rock that survives though frequently kicked by individual, religions, labor, management and the Government. Any plan by anybody or group that ignores the Golden Rule will fall short of its maximum accomplishment. One might just as well ignore the law of gravity while scaling a high mountain.

BASIC OBJECTIVES

Thus one of the basic objectives of profit sharing must be fair treatment of all involved individuals. This will form a stepping stone to a second objective, that of making the working experience a pleasure instead of a grind. One half of the waking hours of the work day are spent on the job and if pleasant, they can add greatly to human satisfactions and happiness.

The second objective forms the stepping stone to the third — namely, increased production. This provides everyone with greater enjoyment of the material things of life. Developments in materials, machines and methods have revolutionized living but only within the limit of human effort. It is frequently stated that the average individual operates at about half efficiency.

Increased human efficiency provides the means for attaining the fourth objective, greater compensation for all. Much thinking will place this fourth objective in first place. There may be argument for such placement but increased compensation without square dealing, pleasant working and increased production can have little advantage.

Some may wish to add other objectives. It can be safely said, however, that any plan that does not give prime consideration to the listed four will fall short of the desired accomplishments.

IMPORTANT PHILOSOPHIES

Genuine profit sharing requires readjustment in much current thinking. An honest appraisal of some current philosophies in industry calls for swallowing some bitter pills. The stockholder insists that an enterprise can not start without his contribution and that he should wear the crown. The manager says that capital must be converted into successful operation and his part is paramount. The worker maintains that capital and management are helpless without his productive effort. Each can prove his own importance and be justified. However, each must remember that the three are links in the chain which will only be as strong as the weakest link. Each must function, be rewarded according to his effectiveness and be respectful of the other two.

Profit sharing can not be an excuse for inadequate payrates. The average rate must be comparable to that of similar work in the area. The Golden Rule requires that each be paid according to his contribution to the enterprise. Individual rates must thus be relatively correct. This applies to all three links of the chain. It is the hire for the service rendered by all.

In current practise the stockholder is not paid any hire for his service—the use of his money. He hopes to be paid but is not assured of any hire. Why shouldn't he be paid a hire at the going rate as an expense to the entire operation and before the profit is determined? This would be a bitter pill for the Inter-

nal Revenue Department but is sound principle just the same. Even the Government can't kick the Golden Rule around. Should profit develop beyond all hire, then a general sharing becomes more logical.

ANOTHER PROBLEM

Management presents another problem. Generally it sets all payrates for human effort, including its own. Some management compensations are governed by competition while others are in the wide open spaces. The stockholders may enter the control. An evaluation of management ability and compensation is sorely needed. It is grossly unfair to pick the figures out of the air.

Considerable effort has been made to more accurately gauge the relative compensation or hire for the worker. There are many job evaluation plans in individual enterprises but few are interrelated. Much more effort should be put into this field. Even within a single enterprise, job evaluation is not a complete yardstick for individual contribution. Two workers on the same evaluated job may differ widely in their contributions involving quality, speed, cooperativeness, etc. This calls for a merit rating on performance in fairness to all. In this respect the union conception of uniformity of payrates violates the Golden Rule.

There is an exaggerated practise of special rewards for length of service and seniority. Experience is a wonderful factor in improvement and deserving of recognition as such improvement occurs, right in the paycheck. When improvement ceases, no further pay raises are in keeping with the Golden Rule. The same principle applies to seniority. This is a bitter pill for many to swallow. It may seem cruel to some, yet the principle of "compensation according to contribution" cannot be kicked around without dire results.

Another important philosophy is the necessity for understanding of the enterprise by all concerned. In brief, management must open the books and place the cards face up on the table. If there is to be team work, each player must know the rules of the game, the signals and the score. If this is denied, there is only lip service to the expression of teamwork. For instance, consider a football team, the backfield following a different set of signals from that of the line. That happens all too often.

Profit sharing without loss sharing is unfair and not sportsmanlike. A player must not run home when the team is losing. Each must take the bitter with the sweet. Operations are not always profitable, contrary to the belief of many.

A review of the foregoing philosophies indicate that the three important links, investor, manager and worker have been recognized and paid their hire for their efforts toward successful operation. If, after the payment of all costs, reserves and taxes, a profit appears, it is logical that such profit be equitably distributed, each according to his contribution. Worker and manager contribution may readily be established from the paychecks. The stockholder has contributed dollars. It seems a logical conclusion that the profit distribution could be made on the basis of a uniform percentage of all dollars earned and all dollars invested. Everyone has a proportional stake in the enterprise.

PROCESS OF PROFIT AND LOSS SHARING

There seem to be five factors in the Profit and Loss Sharing process.

(1) Determination of the net profit.
(2) Determination of distributive portion.
(3) Allocation of profit shares.
(4) Types of payment of shares.
(5) Operation under loss conditions.

(1) DETERMINATION OF THE NET PROFIT. Without question the net profit is what is left after all legitimate charges against the year's operations have been made. These charges consist of operating costs, reserves for depreciations, bad accounts and all applicable taxes, including income taxes. Many plans are based on the profit before income tax deduction. There is no more binding obligation than income tax and it should logically be deducted.

Then there is a responsibility of a company to continue in business which provides a certain job security for all workers and a guarantee of hire for the investors. There should be a protective reserve fund against emergencies and some portion of the net profit should be set aside before any distribution. It need not be a separate account and could readily be credited to surplus.

Most concerns set up an additional reserve for expansion of plant and equipment. There are certain arguments for the practise but it is contrary to basic principle. Such improvements increase the overall value of the investors' equity at the expense of the employees. The book value of the shares is increased. Plant and equipment are capital items and any increase therein should be accomplished by an increase in the capital investment. This idea is not popularly accepted at this time. The investor is assured of current net plant value through depreciations. He is not entitled to any values he did not buy when making his investment except in his share in the profits. He should plow back the profits by purchasing more stock if expansion is necessary.

(2) DETERMINATION OF DISTRIBUTIVE PROFIT. Assuming that all charges as previously outlined, including hire for the use of investors' money, depreciations, reserve for all applicable taxes and an emergency reserve, all that remains is the distributable profit. This concept is not currently accepted. Usually the Directors reserve the right to set a percentage of the true net profit for distribution. This may be legitimate but only because of the theory of overlordship of the investor. In principle the entire true net profit should be distributed with the investor receiving his legitimate portion thereof in addition to the hire previously paid for the use of his money.

(3) ALLOCATION OF PROFIT SHARES. It is assumed that every person has been adequately compensated for his contribution to the operation. When the operative result is distributive profit, each should share proportionally according to his contribution, whether it be human effort or through investment. The formula is simple. The total payroll would be added to the investment account and the profit would be pro-rated dollar for dollar, a sort of uniform dividend on every dollar earned and every dollar invested.

The sharing by new employees and those severing working relations during the profitable year presents a problem. Some concerns provide a waiting period and some cancel any payments after severance. Both practices resemble penalties. There is a value in qualification for sharing when the applicant accepts the job. Also payments after severance create

good will. This practice means that the worker shares for the portion of the year in which he has made a contribution of effort.

(4) TYPES OF PAYMENT OF SHARES. The simplest method of payment is one bulk cash distribution when the profit shares are determined. If shares are relatively large there is chance of disturbing the economic stability of the recipient. It is better to break the shares into several payments scattered over the succeeding year. Notes may be given for the deferred payments if desired.

Some concerns may prefer to pay part in cash and apply the balance to fringe benefits such as pensions or retirement plans. Some others prefer to apply the entire shares to fringe benefit accounts. If the decision is left to most recipients the choice will be for one bulk cash payment. In the long run this works to the detriment of the recipient. Sudden prosperity is difficult to handle by most human beings.

(5) IN CASE OF LOSS. Practically every business enterprise runs into loss periods. Injection of the Golden Rule will dictate that if everyone shares in the profitable periods, everyone should share the burden of loss. If the profit is shared by dollars invested and dollars earned, losses must be shared on the same basis. The hire of men and money would have to be reduced by the percentage that the loss bears to the total hire of all.

EMPLOYEE CO-INVESTMENT

The adoption of a suitable Profit and Loss Sharing Plan will go a long way toward removing obstacles to successful operation. This is particularly true if it is coupled with adequate Job Evaluation and Merit Rating Plans. This is particularly true if the underlying purpose is genuinely to provide a Square Deal, in some contrast with nationally publicized New Deals and Fair Deals. One might optimistically consider the story concluded.

However, the gate is still open for the ultimate human relationship in industry. There is still the line of demarcation between the owner and the employe, the stockholder and the worker. The ideal teamwork set-up is where every worker is a part owner and every part owner is a worker. This cannot be realized in every enterprise, particularly in the larger units where part of the ownership results from strictly investment objectives. Ownership by employees is very frequently encouraged in both large and small units.

Several agencies, including organized labor and Government, prefer to maintain a demarcation line between owner and employee. The motives are open to question. Complete teamwork requires the removal of that line. The sale of stock to employees is the ideal solution but the employee must understand that he is not only buying a right to possible dividend but also a responsibility equal to that of all other stockholders. He must be told of the difficulties and hazards of possible later disposition of his shares.

NO "PACKAGE" PLANS

Co-Investment, like Profit and Loss Sharing must be patterned according to individual enterprise conditions. There are no "package" plans. The capital structure may make stock sales quite awkward, if not impossible. There are plans in operation wherein the employee lends money to the enterprise on some form of investment note which carries a guaranteed rate of interest and some further consideration during profitable years. This is a sort of interim crutch toward stock purchases.

TAXATION IMPLICATIONS

Recent years have made all tax conscious. This includes enterprise which is called upon for heavy assessments. When employee sharing plans are drawn properly, much of the profit sharing funds are deductible from enterprise taxable income. This must not be a primary objective even though quite important. Heavy tax rates should not be applied to the extent that they destroy the individual incentive nor his desire to fulfill his opportunity of, or his responsibility toward free enterprise.

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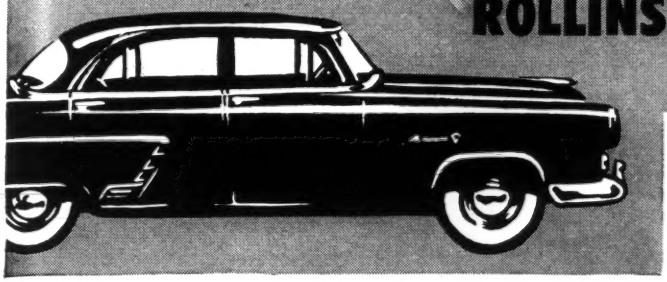

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Inventory Control

By ROBERT S. GOLDBERGER
and
EMANUEL KESSLER
Manufacturing Engineers,
Worthington Pump and Machinery Corp.

This article outlines the derivation and application of a method for easily determining the optimum frequency of procurement of various materials, at which point the combined inventorying charges will be a minimum.

ONE OF THE major requirements of a well functioning industrial enterprise is proper inventory control. This is equally true in periods of high or low industrial operation. Proper inventory control insures the correct amount of material, at the desired time and place, at a minimum of cost. This article outlines the derivation and application of a method for easily determining the optimum frequency of procurement of various materials, at which point the combined inventorying charges will be a minimum.

The reduction of values to chart form provides for the practical application of this method at the operational level. The initial reduction in either average inventory or indirect costs releases working capital for other investment. By continuous use of the charts, average inventory and indirect expense are evenly counterbalanced, thus insuring a minimum of operating expense to the enterprise.

DERIVATION

The three main factors involved in the cost of inventory are:

A—The Cost to Procure
B—The Cost to Hold or Store
C—The Cost of Capital

These factors must be balanced in such a way as to insure the efficient functioning of an enterprise.

The Cost to Procure. A represents the indirect expense needed to procure an item for stock. An item is defined as one type or part, peculiar in itself as to design, material, appearance, etc. The quantities of each item are not considered, since it is assumed that the indirect expenses incurred in procuring an item do not vary directly with the quantity ordered. Thus it is assumed that it costs as much to prepare and process an order for one motor as it would to prepare and process an order for one hundred of the same motors. Based on a certain level of volume, the minor variation in processing costs due to quantity (extra material handling etc.) will not affect this assumption to any appreciable degree.

This procurement expense can be incurred by an outside purchase, by processing an item through the manufacturing section of the enterprise itself, or by a combination of the two. Therefore, the cost to procure entails apportioning the proper indirect expenses against the volume of procurement orders (in items) processed. Proper distinction should be made between different procurement methods. Thus orders may be designated as purchase, machine shop, fabricating shop, foundry or such other classes as are deemed necessary. Properly apportioned indirect expenses will be applied against the volume of the particular class of order designated. As an example: The Purchasing Department may process 10,000 orders in one year with an average of one item per order. The Indirect Expense Budget for this department, along with some portion of the indirect expenses of other departments involved in the purchasing function (Engineering, Accounting, Receiving, etc.), plus an apportioned amount of general overhead (heat, light, taxes, depreciation, etc.) may amount to $20,000.00 per year. The cost to procure a purchased item would be $\frac{\$20,000}{10,000} = \$2.00$ per order.

If there had been an average of two items per order processed by the Purchasing Department then the total volume of "item" orders would be 2 x 10,000 or 20,000 items per year. Therefore, the cost to procure a purchased item would be $\frac{\$20,000}{20,000} = \$1.00$ per order.

Within the limitation of a not unreasonable variation in total volume, indirect expenses, or both, we can say that an item ordered more than once a year will have a procurement charge varying directly with the frequency of ordering. Thus, using the first example of a $2.00 charge per order, a purchased item ordered once a year will have a procurement charge of $2.00; if ordered twice a year, a charge of $4.00; three times, $6.00. The procurement cost therefore will depend on the cost of ordering an item and the frequency (turnover) of procurement. Letting X equal the number of turnovers in one year we have a procurement charge of AX.

THE COST TO HOLD

The Cost to Hold. B represents the expense involved when an item is stored for future use. It includes such indirect expenses as heat, light, power, insurance, obsolescence, taxes, storage space, wages to storaging personnel, etc. Therefore, the cost to hold entails assembling the proper indirect expenses pertinent to the storaging functions and apportioning these expenses against some convenient measure of value or volume. This measure might be storage area or volume, resulting in some cost per square or cubic foot. Or, this measure might be

related to the total volume of orders, of all classes, for stock items processed in the enterprise. This results in a cost per order.

It is believed that the space taken up by an item is more indicative of the proper carrying charge than is a cost per order figure. However, space requirements for each item involve cumbersome calculations.

ANOTHER METHOD

Another and possibly the best method would be to take the average total inventory value for the year or for each of the past several years and divide this into the total storaging indirect expenses for these years, finally deciding on one figure for the proportion or percentage charged against the average value of the goods in stock. Note that this method gives an averaged figure which can be initially applicable for the present level of business and cover all classes of inventory. One may question its reliability where commodities equivalent in value to diamonds and straw are included in the inventory. It is at once obvious that the space requirement per dollar of value for the "straw" is much greater than that for the "diamonds". However the cost of space itself is by no means the only criteria of storaging expense. Costs of handling, pilferage loss, policing against theft, packaging protection, and controlled atmospheric conditions are some of the other factors worthy of study. Thus if all these factors are carefully weighed, the over-all expense-average inventory ratio may appear more reasonable. A further refinement can still be achieved by applying individual expense-average inventory ratios to predetermined homogeneous commodity classes. However, this refinement may be of value only when the use of one over-all expense-average inventory ratio has brought the inventory valuation to its optimum point, as will be discussed herein. At that time the extra expense of assigning individual expense-average inventory ratios may be warranted by a further reduction in either average inventory or indirect expense.

The effect of changed business activity on this expense-average inventory ratio may be large or small depending on the nature of the change, the type of business and the elasticity of meeting the change. Thus changed conditions would warrant a re-examination of the ratio. Periodic (annual) recalculation and comparison also will enable the ratio to more nearly reflect current conditions.

The following discussion considers the use of one over-all ratio at a given volume of business in the determination of carrying charges.

If P represents the unit cost of an item, Q the yearly consumption and h the percentage charged against the average value of the item in stock, we have the following representation for the carrying charge (cost to hold):

$$B = \frac{PQ}{2X} \quad (h)$$

Where $\frac{PQ}{2}$ represents the average yearly inventory if procured at one time (assumes straight line consumption and no reserve quantity) and, when divided by the number of turnovers per year, X, represents the average value of this inventory item at any one time. This factor when multiplied by the expense — average inventory ratio (h) results in the carrying charge for the item.

The Cost of Capital, C represents the expense involved when too much of the working capital is tied up in inventory. The difference between the amount of capital tied up in an item when yearly requirements are secured by one procurement order and when secured by more than one procurement order, represents a potential saving of capital which could be invested elsewhere to the benefit of the enterprise. This potential saving in working capital, or "Capital released", is expressed as follows:

$$C = \frac{(PQ - \frac{PQ}{2})}{\frac{2X}{}} \quad (c)$$

C represents the interest rate (%) to be charged on the money released for other investment. It is believed that a fair rate of return on invested capital should be no less than that to be obtained from the present rate of return, after taxes, on the net worth of the business itself. Some thought might also be given to a rate equivalent to the actual return on net worth *before* taxes or on an even higher figure designed (as a top management tool) to insure that as much capital as possible is released for other work.

In the above expression, $\frac{PQ}{2}$ represents the average capital tied up when an item is purchased only once a year. $\frac{PQ}{2X}$ represents the average value of the item when purchased X times per

S. A. M. QUIZ

WHO made the first S A M contribution to management?

WHAT were the circumstances?

WHEN were the first contributions recognized?

WHERE can the Society make further contributions?

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year. The difference represents the capital released. This figure, multiplied by the interest rate (c) becomes the evaluation of the cost of capital. A brief analysis of this expression indicates that the capital released for other work is increased when the item is purchased more frequently.

It can now be seen that the cost of capital must be balanced against the costs to procure and hold to arrive at an expression for inventory charges.

Letting N = the net charge for carrying an item in stock we have:

$$N = AX + \frac{PxQ}{2X}(h) - \frac{(P_1Q - PxQ)}{2}(c)$$

(1) or

$$N = AX + \frac{PxQ}{2X}(h+c) - \frac{P_1Q}{2}(c)$$

Note in the above that Px represents the unit cost of the item for the quantity purchased at X turnovers per year, whereas P_1 represents the unit cost of the item when purchased in one lot for the year.

Thus, for items with unit costs which fluctuate with quantity, the above formula, when substituting the proper charges and evaluated for various turnovers, will enable the calculation of the minimum net charge and a resulting optimum turnover (X).

For items having little or no fluctuation of unit cost with quantity the following should be used:

For a minimum charge, N,

$$\frac{dN}{dX} = o = A - \frac{PQ_2}{2X}(h+c)$$

$$X^2 = \frac{PQ\ (h+c)}{2A}$$

$$(2) \quad X = \sqrt{\frac{PQ\ (h+c)}{2A}}$$

The above gives the optimum turnover "X", i.e. one for which the net charge will be a minimum.

Two examples illustrating each of the two formulae follow:

Assume A = \$10
h = 10%
c = 10%
Q = 1000

example #1:—

Let 1000 or more items cost \$1 each
= P, where ($X \leq 1$)

Let 999 — 500 items cost \$2 each
= P, where ($1 < X < 2$)

Let 499 - 1 items cost \$4 each
= P, where ($X > 2$)

using formula (1) above (for varying unit cost) we have:

$$N = AX + \frac{PxQ}{2X}(h+c) - \frac{P_1Q}{2}(c)$$

let X = 1; ∴ P = \$1;

$$N_1 = 10 + \frac{(1)\ (1000)}{2 \times 1}(.20) - \frac{(1)\ (1000)}{2}(.10)$$

N_1 = \$60

let X = 2; ∴ P = \$2;

$$N_2 = 10\ (2) + \frac{(2)\ (1000)}{2 \times 2}(.20) - \frac{(1)\ (1000)}{2}(.10)$$

N_2 = \$70

let X = 3; ∴ P = \$4;

$$N_3 = 10\ (3) + \frac{4\ (1000)}{2 \times 3}(.20) - \frac{(1)\ (1000)}{2}(.10)$$

N_3 = \$113

Similarly;

N_4 = \$90
N_5 = \$80
N_6 = \$76.6
N_7 = \$77
N_8 = \$80

Analysis of the above indicates that a turnover of one will result in the lowest net charge. Also note the sudden rise in net charge for three turns. This is caused by the change in unit cost from \$2 to \$4. The net charge is again reduced in succeeding calculations but not to a point lower than that for one turnover.

Example #2:—Let the unit cost P, equal \$1 for any amount from 1 to 1000. Thus formula (2) may be used:

$$X = \sqrt{\frac{PQ\ (h+c)}{2A}}$$

$$X = \sqrt{\frac{1\ (1000)\ (.20)}{2 \times 10}}$$

$X = \sqrt{10}$

$X = 3+$, say 3 turnovers per year

Thus the lowest net charge will result when three turnovers per year are provided for this item. The order quantity would be $\frac{1000}{3}$ or 350 (approximately) per order.

The same principles hold for purchased, shop, foundry or other items and with proper substitution of constants (A, h, c) can be solved for as illustrated.

APPLICATION

The above has presented the reasoning, theory and calculations leading to the development of the two formulae described. Formula (2) is susceptible of extreme simplification for use by inventory clerks now calculating ordering points and quantities. Since the factors A (procurement charge), h (hold charge) and c (capital released charge) are capable of predetermination, the factor PQ (unit cost times yearly quantity) becomes the only variable. Thus charts can be compiled tabulating PQ values for all the various forms of procurement orders with the corresponding optimum turnover value, X, for each PQ. For example, Table I represents a PQ chart covering purchased items where A=\$5, h=10% and c=10%.

TABLE I

X =	1	2	3	4
Purchased PQ =	\$50	\$200	\$450	\$800
	5	6	7	8
	\$1250	\$1800	\$2450	\$3200

The inventory clerk need only calculate the product of the unit cost and the estimated yearly quantity to give him his PQ, then, knowing the type of order, look at the proper chart for the optimum turnover, X. Dividing this number into the yearly consumption gives the optimum order quantity.

Example: Assume that 12,000 purchased bolts, at a fixed cost of \$.10 each, are required yearly. Thus the inventory clerk will calculate a

P'Q of 12,000 X $.10 or $1200. From Table I we obtain an optimum turnover "X" of 5 (1250). Thus the order quantity would be

$$\frac{12000}{5} \text{ or } 2400 \text{ bolts.}$$

The use of such formulae and charts results in a segregation of stock items into groups which automatically classify the items as to relative importance with regard to attention needed for proper control. Those items with the combination of high unit cost and large consumption, which places them in the high turnover group, evidently are the ones where large savings can be effected by proper control. Those with the low unit cost and low consumption will appear in the low turnover bracket. After ordering and with proper controls instituted, these can be set aside to allow for more concentration of effort on the high turnover items.

A program should be worked out designed to scrutinize every phase of the manufacturing process in which the high turnover parts are involved, since even a comparatively small reduction, percentage wise, in inventory representing a large proportion of the capital invested, will result in a sizable saving in dollars.

Thus, these high turnover parts should be examined for:

a) Engineering redesign
b) Material substitution
c) Manufacturing methods
d) Production control
e) Materials handling
f) Reordering lead time
g) etc.

CONCLUSIONS

A relatively simple system for insuring sound inventory control has been outlined. The system can be installed within the present workings of most Stores Departments by having the clerks, presently performing the ordering duties, utilize charts of the form illustrated. Savings by use of this system are indicated from several directions. A reduction in total average inventory, a reduction in indirect expenses, or both, may result. Individual analysis of present methods may reveal that large inventories are not warranted. Other analyses may indicate that the cost to procure is such that a reduction

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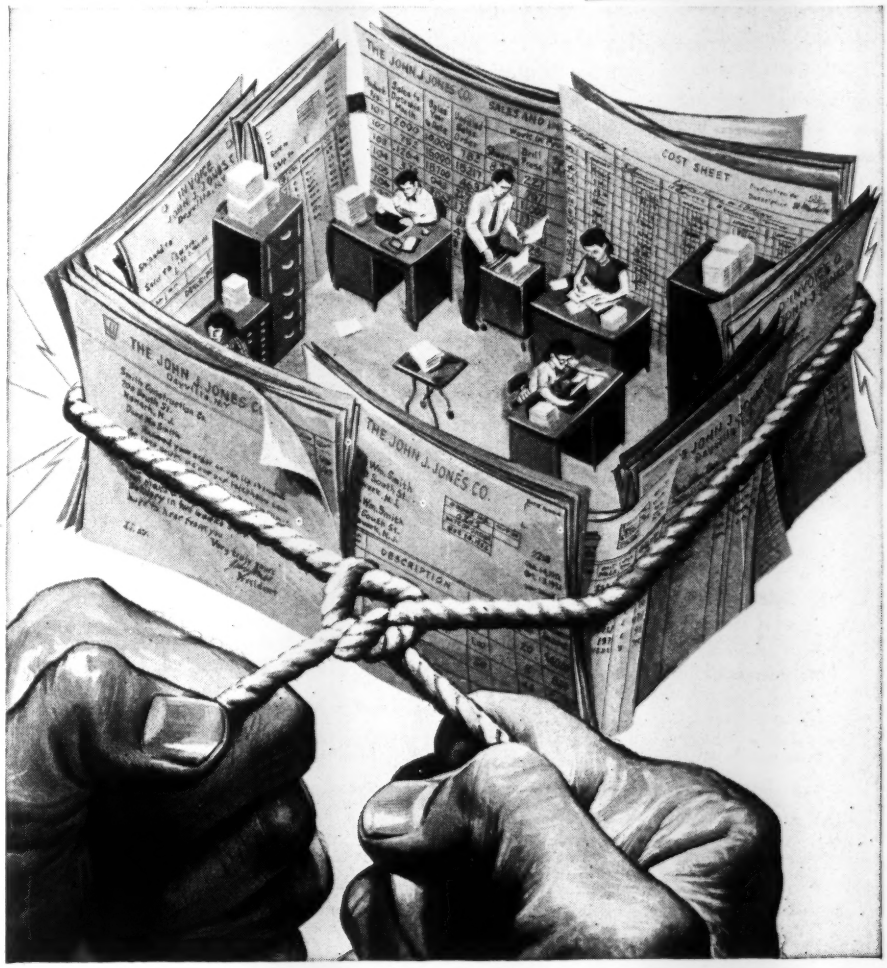

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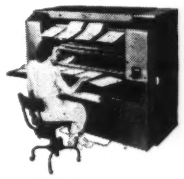

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in the number of times ordered, with a resulting increase in average inventory, is strongly warranted. This reduction in order volume will reduce the work load for processing the particular types of orders and therefore will result in the ability to reduce the work staff or to direct their energies into other productive channels. More accurate and efficient ordering by the Stores Department through the method outlined should eliminate some extraneous operations now being performed by its clerical help and thereby realize further savings.

One point to be kept in mind is the fact that charges set up on the basis of present conditions may be made unrealistic as the result of "outside" factors such as a change in the general volume of business, as well as by the use of the formula itself. Thus, a large reduction of procurement orders and the requirement for less indirect help in processing these orders will result in a possible reduction in indirect expense, creating a new expense—volume ratio. Also, it is possible that the opportunity for reduction in expense along this direction will not be taken. Thus a reduction in order volume with the same previous total indirect expenses will result in an even greater procurement charge per order.

Therefore, periodic re-calculation of procurement charges to fit current actualities is of the greatest importance to the proper functioning of the proposed formulae.

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Speakers and subjects to be covered during the Conference are:

Dr. Lillian M. Gilbreth, "A Critical Analysis of Industrial Engineering Progress, Future Prospects and the Human Factors Involved."

Mr. R. Conrad Cooper, Vice-President, Industrial Engineering, U. S. Steel Company, "Management's Stake in Industrial Engineering."

Dr. Robert P. Brecht, International President, National Office Management Association, Head of Industry Department, Wharton School, "The 'Logic of Efficiency' and Its Acceptability in Practice."

Dr. George W. Taylor, Former Chairman of the Wage Stabilization Board, Professor of Industry, Wharton School, "The Acceptance of Technological Change by Workers and Unions."

Mr. James Foley, Director of Work Methods Improvement, Remington Rand, Inc., New York, "Work Simplification in Modern Business Management."

Mr. A. L. Mettler, National President, Systems and Procedures Association of America; Manager of Systems, Electric Storage Battery Co., "The Setting Up of Systems Functions."

Mr. Elles Derby, Director of Management Training, Metropolitan Life Insurance Co., New York, "Defining, Selecting and Training Systems Men."

Mr. Benjamin S. Graham. Director of Future Demands, The Standard Register Co., Dayton, Ohio, "Work Simplification, A Tool in Human Relations."

Mr. Stanley M. Ruttenberg, Director of Education and Research, C.I.O., "The Union Attitude Towards Technological Change."

Mr. H. F. VanGorder, Director, Methods Planning Division, United States Steel Co., "The Problem of Setting Office Standards."

Mr. James Duncan, The Work Factor Company, "Predetermined Time Values for Setting Standards."

Mr. Bruce Payne, President, Bruce Payne Associates, "Incentives That Work"

Mr. Jerome Barnum, Jerome T. Barnum Associates, Harrison, N. Y., "Selling and Training Aids in Shop and Office Projects."

Mr. Wright Manvel, Director of Wage Standards, General Electric Company, "A Critical Evaluation of Predetermined Time Value Systems."

Dr. Dawson Dean, Director of Personnel, American Home Products Corp., New York, "Testing and Selection Techniques to Aid Industrial Engineering."

Dr. Rexford B. Hersey, Industrial Psychologist, "Does the Industrial Engineer and Office Systems Analyst Need to be a Psychologist?"

Mr. Richard Neumaier, Office Systems Consultant, "Mechanization in the Office."

Mr. Nicholas A. Martucci, Vice-President, Flexitallic Gasket Co., Camden, N. J., "Practical Application of Simplification Techniques in Both Shop and Office."

Mr. C. A. Slocum, Executive Director, Society for Advancement of Management, New York, "Effort Rating and the S.A.M. Rating Project."

Mr. Robert E. Heiland, Professor of Industrial Engineering, Lehigh University, "The Ratio Delay Study for Setting Standards."

Mr. Paul B. Mulligan, Paul B. Mulligan Co., New York, "Predetermined Time Values in the Office."

Mr. David Ginsburg, Manager, Philadelphia Division, The Wheeldex Co., "The 'How To Do It' of Office and Shop Systems Work."

Each conferee will have ample opportunity to present an actual methods project, working it out by constructing necessary jigs, fixtures or paperwork devices in an atmosphere of mutual group discussion with all other conferees.

EXPENSES: REGISTRATION FEE $225.00

This includes a complete conference notebook covering the latest material in the field, the use of all laboratory equipment, materials and supplies, library facilities and recreational activities.

LIVING EXPENSES

Meals and lodging will be furnished at actual cost. Accommodations will be in fraternity houses with single rooms wherever possible.
All communications should be addressed to V. DONALD SCHOELLER, Conference Director, 300 Logan Hall, University of Pennsylvania, Philadelphia 4, Pa.

June 16 to June 27, 1952 in the Frederick Winslow Taylor Management Laboratory

ACT NOW — REGISTRATIONS ARE LIMITED!

Survey Shows Poor Communication Wastes Engineering Manpower

This is the first in a series of executive research projects designed to help alleviate the current shortage of engineers.

A LARGE PER CENT of the potential managerial talent of engineers is being lost to industry today, due to poor communications between engineers and the top management of industry.

This was disclosed in a nationwide survey of 350 industrial companies employing some 50,000 engineers. A 48-page report on the survey, the result of six months research by the National Society of Professional Engineers, was released in March by L. L. Dresser, president of the professional society.

The report points out that only 34 per cent of the companies have any planned program of information and indoctrination to prepare engineers for future management leadership. This lack of adequate communications between company managements and their engineers is depriving industry of potential leaders.

FIRST STEP IN EXECUTIVE RESEARCH PROGRAM

The survey report, entitled, "How to Improve Engineering-Management Communications", is the first in a series of executive research projects initiated by the professional society to help alleviate the current shortage of engineers by assisting industry in securing the best utilization of their present engineering force.

The research program includes surveys of general management and top engineering executives on current practices in engineering-management relations and the pooling of up-to-date experience for the benefit of industry and the engineering profession.

The survey report shows that 88 per cent of the firms questioned seek the opinions and suggestions of their engineering people. However, nearly half of the companies stated that they were not satisfied with their present methods of communication.

FOUR CHIEF INTERESTS

The four chief interests of engineers are: opportunities for advancement, technical trends, new products, and expansion plans. The four topics of least interest to engineers are: corporate organization, sales and earnings, sales promotion, benefits and security.

Industrial managements would like to have the pooled experience of industry on the following topics:[1]

How to Improve Engineering-Management Communications

How to Improve the Utilization of Engineering Manpower

How to Attract Qualified Engineers

How to Train Engineers in Industry

[1]See MODERN INDUSTRY, April 15, 1952.

CHIEF ENGINEER IS KEY MAN

The survey showed that the key engineering executive throughout industry is the Chief Engineer. As the man in contact with top management on one hand and all the rest of the engineering employees, on the other, he controls communication in both directions. He also determines the extent to which engineers participate in company planning.

It was found that although a large majority of companies want the opinions and suggestions of their engineers on company policies, there is minor participation in planning by the majority of engineers. Also, 63 per cent of the companies surveyed provided no special publications or communications channels for engineers, although 88 per cent of the firms want the opinions and suggestions of their engineers. It was learned that a few large companies, each employing over 2000 engineers, do the best job of communicating with their engineers.

PARTICIPATION BY TOP MANAGEMENT REQUIRED

In all companies, personal discussion between engineers and their immediate supervisors is the predominant method of communicating company policies and informing engineers of company plans. The line of supervision is adhered to in this practice, with each level passing information down to the next. Seldom do company top executives speak and write directly to the engineering staff on topics of interest to them.

Asked for opinions on how to improve communications, industrial executives replied that participation by top management in communications with engineers should be broadened. The majority opinion was that top management meetings with engineers would stimulate them to apply their analytical talents to overall company success.

REPORT OFFERS IMPROVEMENT FORMULA

The report sums up the survey findings with a review of new techniques and the latest research on improving group communications, and suggests a detailed formula for improvement in engineering-management communications.

The suggested program includes group meetings, management letters, bulletin boards, and special publications.

THE MANAGEMENT BOOKSHELF

New Ways to Better Meetings by BERT and FRANCES STRAUSS, The Viking Press, 177 Pages, $2.95.

THE BLURB ON THE INSIDE of the jacket neatly covers the purpose and contents of the book:

"This book offers a new kind of practical help for both leaders and the so-called led. Step by step, it tells how to get the members of a group, small or large, to participate; how to reach decisions without straitjacket Rules of Order; how to use the valuable tool of role-playing; how the small meeting works best; how to involve an audience in a large meeting; how to get the best results from a big conference."

Without question this is an excellent, popular version of the techniques to be used in securing genuine group thinking. The book is exceedingly easy to read — almost too easy — considering the complexity of the subject. This book is not a superficial or casual treatment of the principles and skills needed for executive group conferences, but it is written in such a simple, popular style that it is difficult for one to think critically about the ramifications of the problems and the required skills when one is being wooed so completely with the words and the style.

The man in industry may very well feel, and perhaps with some cause after reading this book, that his "situation is different." The cases and the illustrations are slanted more toward community groups, and the authors have not faced up to the essential authoritarian organization of industry. An industrial man may well conclude that doing such things in his plant is too idealistic.

As one who has been trying to use some of these techniques in an industrial situation, I firmly believe that they have a real place, if we don't try to assume that we must accept the "democratic process" in all its elements. It is true that, while the participative approach which the authors discuss has some democratic elements, we should not, therefore, conclude that we cannot use them because we cannot have a true democracy in industry. In our autocratic hierarchies the men at each management level are responsible for results, and this is as it should be. But the executive does not have to behave as an autocrat with his subordinates even though he is responsible for results. It seems entirely feasible that he can use his authority rationally and bring his group of subordinates, managers or employees, to the point where they share that responsibility both in their eyes and in his eyes. The executive can measure his own success in getting group action in terms of the few times he must exercise his veto powers.

In their attempt to portray an easy reading book the authors appear to have slighted the basic concepts upon which their whole approach is based. Unquestionably they had to be exceedingly familiar with these concepts in order to write the book. It would seem that a more comprehensive listing and treatment of the concepts such as these would be helpful: the change process and people; how people learn, participation and problem solving.

In addition, it would have been well if the authors had developed a check list which would help the reader who might want to act as discussion leader to gain greater insight into himself. This is treated in a very brief way in the introductory part of the chapter, "Can the Chairman Stop Being Boss," and also in the check list "Appraising the Situation" in the chapter on "Stimulating Change." An additional check list of incisive questions to assist the reader in gaining insight into himself would appear to have been exceedingly helpful.

The book is a must for those who have any curiosity whatsoever about the participative process. It is an excellent introduction to the subject and should stimulate the reader to investigate the whole area more thoroughly. The bibliography at the back of the book provides an excellent listing of some of the more pertinent books and articles. The authors are to be commended for their excellent handling of a most difficult and nebulous subject.

R. C. SAMPSON
Staff Representative
Office of Vice President—Personnel
The Chesapeake and Ohio Railway Co.,
Cleveland, Ohio

Quality Control and Industrial Statistics by ACHESON J. DUNCAN (Associate Professor of Statistics, John Hopkins University), 1952, Richard D. Irwin, Inc., Chicago, Ill., $9.00.

THIS BOOK IS INTENDED primarily as a text for engineering and business students in their second or third year of college. It is also intended to serve as a reference book for quality control engineers and industrial research personnel who seek the aid of modern statistical techniques. With regard to the first purpose, contact with an instructor who has taught engineering statistics for many years brought the comment that this book is better than any previous book he has used for that purpose. Regarding the second purpose, any personal copy of this book stays on top of

my desk and is referred to more often than any other text.

The scope of the book includes the fundamentals (117 pp.) of probability, frequency distributions, and sampling distributions; includes acceptance sampling (112 pp.) by both attributes and variables; includes control chart (95 pp.) theory and practice; includes the statistical methods (230 pp.) of correlation, analysis of variance and the design of experiments as applied to research, development, design, process and industrial engineering problems; includes selected mathematical proofs and technical material (46 pp.) and finally includes the best and most convenient set of tables which has yet appeared in any text. Most of the material which the student or the practical engineer will require is to be found in this volume. It is remarkably complete.

The material is well organized and presented. The index is satisfactory which is a prime requirement for a book of this type. While the presentation is in good mathematical form and no liberties are taken with scientific accuracy, the material is quite readable to the average technically trained person who is many years from academic halls. This book is not recommended to the man without technical training or experience.

Some worthwhile innovations are included which have not generally been included in textbooks heretofore. The material on variables sampling is long overdue. The use of the operating characteristic curve in the analysis of variance is an interesting innovation.

In summary, this is the current textbook of choice for the following groups:

(a) The engineer in industry who is using statistical methods in his daily work.

(b) The undergraduate engineering statistics and quality control course.

(c) The engineer who aspires to (a) and is willing to do a lot of work and study to get there.

The book is not intended as a casual introduction for those not yet using these methods. It is solid meat.

FRANKLIN E. SATTERTHWAITE
Arthur D. Little, Inc.,
Cambridge, Mass. and
General Electric Co.,
Pittsfield, Mass.

Collective Bargaining by C. WILSON RANDLE, edited by EDGAR S. FURNISS, published by Houghton Mifflin Co., 740 pages, $8.00.

Professor Randle has made a fine contribution to the field of industrial relations with this excellent book. He has brought to his subject a sound perspective; namely, an understanding of the fact that collective bargaining is a relatively new development, which, although already an institution as a general practice, is still fluid and variable in its specifics. The author has constructively pointed out some of the problems and practices in the field of labor relations, along with his own sound evaluations.

Mr. Randle has kept strictly to the point. For example, he avoids any lengthy dissertation on "management prerogatives" and gives us instead a description of the more definable areas of collective bargaining like wages, hours, labor laws, fringe benefits, and arbitration. Incidentally, the chapter concerning arbitration is one of the best and most detailed sections on that subject that has appeared in any general treatment of collective bargaining. The subject matter of the book is illustrated with excellent examples, charts, and tables. In addition, there is a valuable Appendix which contains copies of labor agreements, a very useful "Glossary of Labor Terms," and a fine bibliography.

The book has only minor faults: we are fortunately spared an overdose of figures of speech, except for John L. Lewis' "Tousled-mane oratory and bushy-browed emphasis"; the author might have clarified certain provisions of the 1949 Fair Labor Standards Act instead of merely mentioning them; and finally, the National Civic Federation did not perish until some time after the "early 1900's."

Collective bargaining is neither static nor transitory. It is a dynamic, continuing process that has been firmly established as a vital part of our industrial life. Labor and management should use it to make consistently constructive contributions to the maintenance of the health of industry and society in general. Collective bargaining is, nevertheless, subject to widely varying interpretations and attitudes, which range from insistence that labor and management bargain about all matters impinging upon production to downright hostility to the bargaining process itself. Ignorance has been, and is, a potent influence on the kind of reception and treatment it has had. Professor Randle's book should prove a powerful antidote to such ignorance.

MILTON J. NADWORNY
Department of Commerce
and Economics
University of Vermont
Burlington, Vermont

THE PROCEEDINGS OF THE SEVENTH ANNUAL TIME STUDY AND METHODS CONFERENCE

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ADVANCED MANAGEMENT

Publication date — JULY

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SOCIETY NEWS

FIRST CHAPTER OFFICERS ELECTED

THE NORTHERN NEW JERSEY CHAPTER rates a "first" in the National Office. The results of their election of officers for the year 1952-53 were the first to reach the Office. The following were elected:

President—GERALD Z. WOLLAM—Westinghouse Electric

Executive Vice Pres.—GEORGE D. WILKINSON—George D. Wilkinson & Co.

Secretary—WILLIAM J. JAFFE—Newark College of Engineering

Treasurer—H. RICHARD CARLSON—A. & M. Karagheusian

V. P. in charge of Meetings—CARL E. LINDENMEYR—Forstmann Woolen Co.

V. P. in charge of Membership and Publicity—ALBERT B. NESKE—Coxhead

V. P. in charge of Research and Training—JOHN FELTMAN—Conmar

Trustee (five years)—DOUGLAS A. LINDSAY—Gould & Eberhardt

ADVANCE MANAGEMENT PATENTED

The Society for the Advancement of Management, Inc., its successors or assigns have as of March 18, 1952 received a patent on the trade mark of ADVANCED MANAGEMENT. This trade mark appears on the front of the magazine in white and black lettering with the title ADVANCED MANAGEMENT and also in black on the contents page.

This occurred after an application for the registration of this trade mark was made on May 20, 1950.

MORRIS EVANS LEEDS

The Society regrets the death of Morris Evans Leeds, a life member of SAM. Mr. Leeds, the founder and chairman of the board of the Leeds and Northrup Company of Philadelphia, manufacturers of electric and heating measuring and controlling instruments, passed away February 8 in Lake Wales, Florida.

Mr. Leeds was affiliated with the American Institute of Electrical Engineers, the American Physical Society, Academy of Natural Science, American Society for Steel Treating, American Philosophical Society, American Academy of Arts and Sciences, and the Scientific Apparatus Makers Association. He became a life member of SAM after twenty years of continuous service in the Society.

CHAPTER STANDINGS
As of April 1, 1952

MEMBERSHIP		CHAPTER PERFORMANCE AWARD	
New York	432	Washington	2909
Chicago	315	Greensboro	2525
Philadelphia	308	Pittsburgh	2134
N. New Jersey	288	Hudson Valley	2098
Cincinnati	265	Allentown	2042
Cleveland	264	N. New Jersey	1875
Washington	234	Milwaukee	1815
Boston	200	New Brunswick	1515
Pittsburgh	197	Boston	1480
Detroit	176	Chicago	1399
Los Angeles	134	Philadelphia	1398
Milwaukee	132	Trenton	1332
San Francisco	110	Baltimore	1268
Greensboro	106	Detroit	1236
New Brunswick	105	Wilmington	1204
Indianapolis	102	New York	1183
Lancaster	96	Indianapolis	1123
Dallas	91	Atlanta	982
Dayton	91	Wilkes-Barre	954
Hudson Valley	87	Cleveland	796
New Haven	87	Central Pa.	789
Asheville	85	Montreal	711
Baltimore	81	Worcester	685
St. Louis	63	St. Louis	625
Bridgeport	61	Lancaster	621
Montreal	60	Cincinnati	582
Worcester	60	San Francisco	554
Providence	57	Dayton	533
Allentown	57	Los Angeles	512
Trenton	55	Richmond	444
New Orleans	53	Columbus	439
Atlanta	53	Dallas	432
Central Pa.	52	Bridgeport	393
Columbus	51	Birmingham	376
Louisville	50	Portland	372
Hartford	50	Manchester	327
Wilmington	50	Nashville	321
Wilkes-Barre	48	Western Mass.	321
Knoxville	48	Asheville	311
Birmingham	46	Knoxville	299
Manchester	42	New Orleans	275
Baton Rouge	38	Louisville	235
Portland	37	New Haven	180
Richmond	33	Central New York	177
Twin City	33	Stamford	132
Central New York	33	Hartford	94
Western Mass.	31	Kansas City	80
Kansas City	24	Providence	64
Nashville	14	Twin City	30
Stamford	12	Baton Rouge	12

ELECTION TO THE BOARD

William L. McGrath, life member of SAM, affiliated with the Cincinnati Chapter, has been elected a director to fill a vacancy on the board of the Globe-Wernicke Company. The election was made by the stockholders of Globe-Wernicke at their annual meeting.

Mr. McGrath is the president of the Williamson Heater Company and the Williamson Dealers Corp.; a director and member of the executive committee of the Cincinnati Gas and Electric Co.; a director of the Fifth Third Union Trust Co. of Cincinnati; and a member of the advisory committee of McCormick Company of Baltimore.

ST. LOUIS ADVANCED WORK MEASUREMENT CLINIC

THE ST. LOUIS CHAPTER of SAM is presenting an Advanced Work Measurement Clinic at the Chase Hotel in St. Louis on May 8-9. Speakers in addition to those listed before are: Alexander S. Langsdorf, Dean Emeritus of the School of Engineering of Washington University in St. Louis, who will discuss "The History and Status of Industrial Engineering"; W. K. Hodson of the Methods Engineering Council of Pittsburgh whose topic is "The Why, How and Wherefores of Methods Time Measurement"; and R. E. Rowland, vice president in charge of manufacturing of the Ralston-Purina Company of St. Louis who will speak on the subject of "The Qualities Essential to Personal Industrial Success". The chairman for the Clinic is George Wanninger, supervisor of standards of the Men's Wear Factories of Rice-Stix, Inc. of St. Louis.

TRAILMOBILE PROMOTION TO MEMBER

S. E. Biggs, member of the Cincinnati Chapter has been named vice-president in charge of manufacturing of Trailmobile, Inc., a subsidiary of Pullman

Incorporated. The announcement was made by W. A. Burns, Jr., President of Trailmobile, Inc., one of the nation's largest manufacturers of commercial truck-trailers.

Mr. Biggs joined Trailmobile in 1947 as manager of its Cincinnati plant. Previously, he has been associated with Consolidated Vultee Aircraft Corp. in New Orleans; with J. E. Case Co., in Rockford, Ill.; and with the Chevrolet Division, General Motors, in various production executive capacities.

RESPONSE TO ADVANCED MANAGEMENT

The response to the articles which have been appearing in ADVANCED MANAGEMENT for the last four months has been unusual. Proof of this is found in the exceptional number of requests to either reproduce or reprint the material, and in the letters of inquiry this Office receives. Also we have received letters of congratulations on the "intelligent management magazine which is bringing to its readers a well-rounded program of planned reading". A large number of other magazines have been running re-writes from our articles.

For the issues of January, February, and March, out of the fifteen articles printed we have received sixteen requests for reproduction and reprint authorizations — this number covers eight of the articles printed with one of them totaling a high of three requests for reproduction alone. Many other articles have brought inquiries and congratulations.

We consider this positive proof that the readers of ADVANCED MANAGEMENT are interested in this magazine and are finding contributions to the advancement of management in its pages.

DETROIT MANAGEMENT CLINIC

THE DETROIT CHAPTER is holding its Fourth Annual Management Clinic in the Rackham Memorial Building in Detroit May 22-23. The Clinic will be divided into two main themes: Personnel and Industrial Engineering. The registration for the Clinic should top five hundred.

The speakers include Allen Mogensen who will conduct the industrial engineering clinic on "Work Simplification". Ewan Clague, Director of the Bureau of Labor Statistics in Washington, will speak on the subject of the "Future of the Bureau of Labor Statistics in Collective Bargaining". Other speakers are: Jack Post, Richard Wrightnour, C. H. Lawsche, Robert Wyland, Professor Burns, George E. Bowles and Walter Cisler.

SEVENTH ANNUAL TS&M CONFERENCE

The Seventh Annual Time Study and Methods Conference sponsored by S.A.M. and the Management Division of A.S.M.E. was held at the Hotel Statler in New York City April 24-25, 1952.

Approximately 1800 management men from the U. S. and the world, representing different industries and interests, attended the sixteen sessions. A complete and valuable edition of the sixteen outstanding speeches will be available soon in the Proceedings, published by the Society.

The Industrial Incentive Award for 1951 was awarded Professor Ralph M. Barnes of the Department of Engineering and Production Management of the University of California, Los Angeles.

APRIL CHAPTER ACTIVITIES

The Asheville, N. C. Chapter featured a panel discussion on wage and salary stabilization. Phillip Brownell, vice president of Ecusta Paper Corp. was the discussion leader. W. A. Egerton, director of industrial relations for American Enka Corp. spoke on the administration of incentive rates and individual wage and salary adjustments, ranging from merit and length-of-service increases to rates for new jobs.

Russell Fultz, control manager of the Dayton Rubber Company in Waynesville, N. C. described general and cost-of-living increases permissible under present regulations and the basis for seeking approval of additional increases. Ralph Ricketson, supervisor of the wage administration for the Canton division of Champion Paper and Fibre Company discussed the regulations on bonuses, health and welfare plans, pension plans and other fringe benefits.

The Bridgeport, Conn. and New Haven, Conn. Chapters held a joint dinner meeting in Milford. Chairmen for the meeting were Nathan Hamar of Sperry Barnes Co. and Lawrence W. Day of Bullard Co. The speaker was Lathan B. Lambert, manager of the New Haven office of Southern New England Telephone Co. whose topic was "Coast to Coast by Radio Relay". Mr. Lambert with his 25 years of experience with the telephone company, spoke on one of the research and development activities that led to increased productivity and demonstrated some interesting equipment.

The Philadelphia Chapter presented the twelfth in their series of Management Problem Meetings. The guest speaker for the evening was Alex N. Yovich, director of the salary and wage administration of Philco Corporation in Philadelphia. Mr. Yovich directed his thoughts toward the meaning of the wage and salary administration, what it involves, and the importance to the company at all times and particularly during times of Government Wage and Salary controls. Following Mr. Yovich's talk, there was an hour question and discussion period.

The New York Chapter was enlightened by Sumner T. Pike, who spoke on the subject of "Atomic Energy Impacts on Management". Mr. Pike, as a former member of the AEC is remarkably qualified to deal with the topic. Prior to his long term of outstanding service with the AEC, he held many important posts in Washington. These offices included positions as business advisor to the U. S. Secretary of Commerce; Commissioner, Securities & Exchange Commission; Director, Fuel Price Division of OPA. Mr. Pike told how industry—its processes and techniques— can benefit from the billions of dollars already poured into the development of atomic energy—an investment far in excess of that represented by this country's largest corporations. He also pointed out how the rapid advances in these fields are accompanied by a host of new managerial problems, and management must face today the need of preparing answers to problems directly related to atomic energy in such fields as research, manufacturing, personnel and sales and purchasing.

Mr. Pike discussed his topic with a brilliant panel of industrial executives and atomic energy specialists. The panel included Miss Annesta R. Gardner,